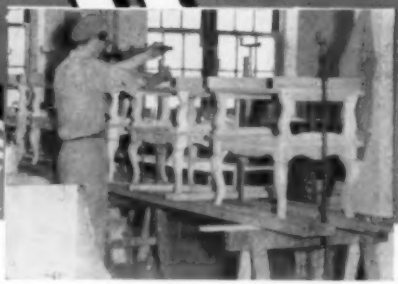
# WOOD WORKING Digest



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A HITCHCOCK PUBLICATION


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**WOOD WORKING DIGEST**

**222 E. Willow Ave. Wheaton, Ill.**

Form 3547 Requested Return Postage Guaranteed



UNIVERSITY MICROFILMS
ATT MR EUGENE B POWER
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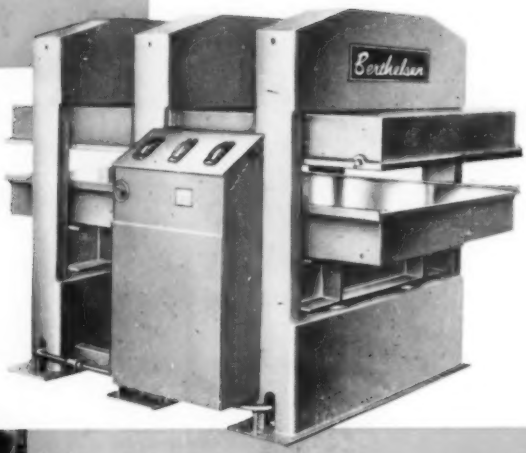
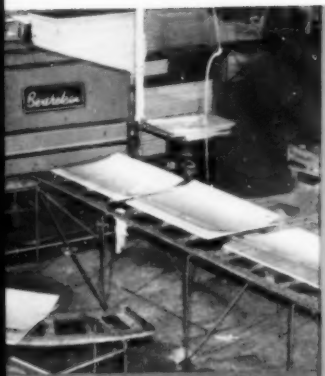
## *Another* PRESSING PROBLEM SOLVED *with a . . .* Berthelsen Press




*Write today!*

Find out how this Berthelsen Press can benefit you.

## PLASTIC VENEERED PANELS

*. . . bonded smooth as glass!*

Only **BERTHELSEN** builds a special low pressure hydraulic hot plate press exclusively for plastic overlay work that produces the quality of work your customers are now demanding.

Reflected light from the plastic surface tends to exaggerate irregularities in the crossbanding veneers, in the lumber core and the glue spread if the finished surface is not absolutely hard and smooth. **Controlled** moderately elevated **temperatures,** controlled moderate **pressures** and the special highly polished surface of the platen on the BERTHELSEN PRESS produce a glass smooth finish which imparts the full beauty of the plastic face sheet to the finished product. This technique compares favorably with the productive output of cold baling methods and can also be used for progressive curing of long work without danger of lap marks.

Moderately priced, this **BERTHELSEN PRESS** is within reach of the smallest manufacturer. It offers many other advantages that result in economies in labor and materials and fewer rejects.

# BERTHELSEN PRESSES

P. O. BOX 1423 • LOCKPORT ROAD • JOLIET, ILLINOIS

# *Plane it extra smooth . . . and fast . . . with this "Oliver" Surfacer*

The "Oliver" No. 261 Surfacer planes stock up to 30" wide, 8" thick, up to 60 lineal feet a minute—faster, if desired. Owners of leading plants find its super-smooth work greatly reduces finishing costs.

The Surfacer has a totally enclosed ball bearing worm gear drive for the feed rolls. The lubricated chipbreaker cannot stick or clog. The four-knife cylinder is brought to a quick stop by a convenient hand brake.

Precision ball bearings are used for all revolving parts and thrusts under adjusting screws. Controls are in easy reach of operator for making quick and easy adjustments. Write for Bulletin No. 261.

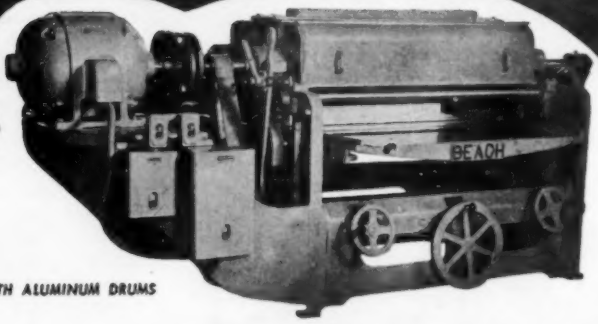
**The "Oliver" line includes Hand Planers and Jointers, Surfacers, Power Feed Facers, and the famous Straitoplane—a machine that planes both sides of stock smooth and parallel in one operation.**

OLIVER

**OLIVER MACHINERY COMPANY**
***Established 1890***
**GRAND RAPIDS 2, MICHIGAN**

# BEACH

## TWO DRUM SANDER




WITH ALUMINUM DRUMS

This new model BEACH SANDER combines many quality features and is adaptable to all types of drum sanding. Its simplicity of design cuts upkeep expense. Aluminum drums help give a fine finish.

Install a BEACH SANDER for easy operation and positive power feed. Write for complete details.

Beach MANUFACTURING CO.
MONTROSE, PENNSYLVANIA

WOOD WORKING Digest

SEPTEMBER, 1954
Vol. 56, No. 9

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Are listed on page 128

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# High Production Glue Spreaders

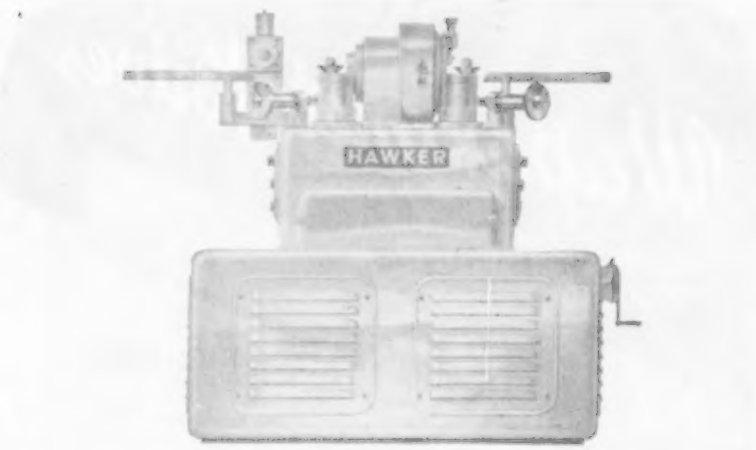
## RESILIENT ROLL BALL BEARING GLUE SPREADER

✻ **BLACK BROTHERS have built more resilient roll glue spreaders during the past fifteen years than all other manufacturers.**

Unmatched in speed, economy, accuracy, cleanliness and quality production . . . the No. 22D Ball Bearing, Resilient Roll Spreader is by far the finest glue spreader available for resins, caseins, and other cold glues. Gluing rolls are deeply covered with the fine synthetic rubber, and are specially grooved to control the amount of glue deposited and to conform to irregularities in the stock. Water cooled doctor rolls are available for use with quick setting glues. Accurate, heavy duty ball bearings are sealed to keep lubricants in, and dirt and glue out. Doctor rolls are heavily *coated* with a highly polished, nonferrous surface to accurately control the glue spread. Investigate the 22D Spreader today . . . write for supplement to Bulletin 11-A.

*"If It Is Gluing Equipment — We Have It"*

**THE BLACK BROTHERS CO., INC.**
MENDOTA, ILLINOIS, U. S. A.




# BEST DEAL IN WOODWORKING MACHINERY

## *AND NOW'S THE TIME TO BUY*

The money being wasted on obsolete equipment can be put to work paying for fast, modern Hawkers and earning profits as well!

The new Hawker rod turning machine is today's most productive, profitable investment in the field.

*BEST PERFORMANCE:* A precision heavy-duty machine. Versatile. Minimum maintenance. Maximum economy.

*BEST PRICE:* Only $2,995 (F.O.B. Dayton, Ohio) for Model 1000 Hawker Rod Turning Machine complete with motors.

*BEST TRADE-IN:* Your old rod turning machine may make the down payment on a new Hawker!

*BEST TERMS:* Reasonable financing available. Only 25% down!

*BEST DELIVERY:* Within 30 days—thanks to our new facilities and volume production.

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HAWKER

**MANUFACTURING CO.**

**1449 KEOWEE STREET, DAYTON 4, OHIO**

**MACHINES FOR THE NEW AGE OF WOOD**

# Wapakoneta Knives

**ASSURE HIGH SPEED PRODUCTION**

## BIG CHIEF

The most dependable knife for general purpose high production work.

TRADE MARK

SINCE 1891

## MOHAWK

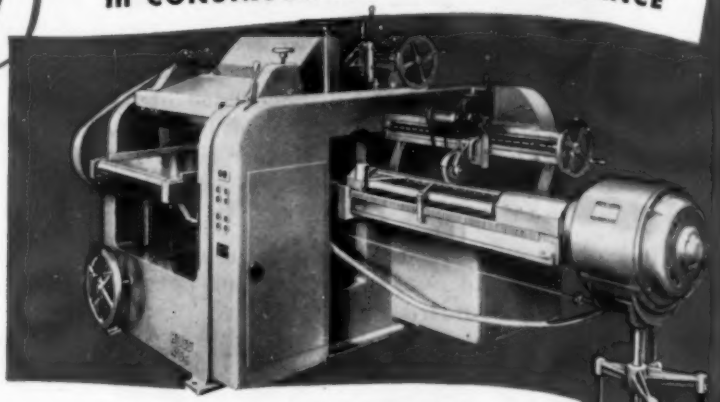
Can withstand hard knots in Southern and similar soft woods.

THE WAPAKONETA MACHINE COMPANY

WAPAKONETA, OHIO

*Knives Engineered for the Job Since 1891*

# for DOUBLE SURFACING ROUGH LUMBER the BUSS No. 55 is YEARS AHEAD in CONSTRUCTION and PERFORMANCE



If you are looking for the fastest, best and most economical way in which to surface rough lumber, be sure to get the complete details of our No. 55, 30" x 14", Heavy Duty Double Surfacer. It's years ahead of any other planer built for this purpose as a simple comparison of salient features will readily disclose. Note the following structural superiorities:

1. Variable feed — from 30 to 175 ft. per minute. 2. Chromium plated beds and bars — for longer wear. 3 Heavy built-in grinders and jointers. 4. Anti-friction ball and roller bearings throughout. 5. Sectional feed roll and chipbreaker. 6. Large diameter cutterheads with high-speed TUNGSTEN knives for longer wear and smoother finish. 7. Completely motorized with push-button control. 8. Shearing Bar to prevent damage from loose knots. 9. ONE-SHOT lubrication for smooth running and insurance against neglected parts. Write for complete description. Ask for bulletin 55.

**FLOORING MILLS and KINDRED PLANTS**

No. 55 is also available in 20-inch width with speed stepped up to 275 ft. per minute. This model has proved itself a "bear-cat" for Flooring Mills and similar operations. Let us tell you about it.

**BUSS**
SINCE 1862
MACHINE WORKS

PLANER SPECIALISTS EXCLUSIVELY

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HOLLAND, MICHIGAN

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**CONSIDER H. WILLETT, INC.**

MANUFACTURERS OF *Fine Furniture*

3001 WEST KENTUCKY STREET, LOUISVILLE 11, KENTUCKY

*Writes:* "Some months ago we installed a large capacity Standard kiln, of the package type. This kiln holds in the neighborhood of fifty thousand feet of lumber, and dries it in record time. The texture of the lumber taken from this kiln is perfect. It's soft, easily worked, and shows a minimum of shrinkage.

"We congratulate you on the excellence of this kiln and assure you that our next kiln will be a Standard."

This is the *Standard* kiln referred to by Mr. Brandon. One of the biggest single package kilns, it is 34 ft. wide, 26 ft. deep, and has a door opening 22 ft. high with no pilasters.

*Manufacturers of Internal Fan Kilns*

**Write for Illustrated Standard Catalog**

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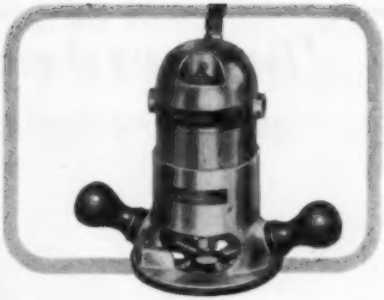
*Engineers and Manufacturers Since 1887*

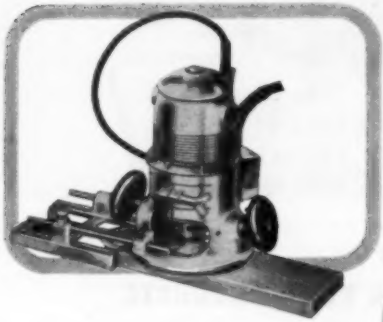
**DRY KILN COMPANY**

**798 S. Harding St.** **Indianapolis 21, Ind.**

## STANLEY ROUTER

**No. R8A-¾ H. P.**





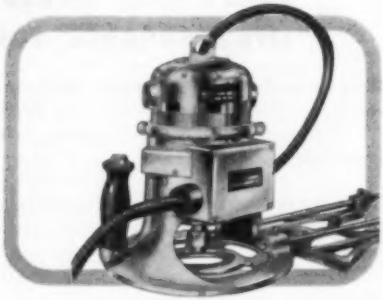
## STANLEY ROUTER

**No. R5B-1 H. P.**

## STANLEY ROUTERS

**No. R22-2½ H. P.**

**No. R33-3 H. P.**



Stanley Routers are the most versatile tools in the woodworking industry for high speed production . . . they save time and cut costs. Complete line of accessories. Write for complete information to Stanley Electric Tools, 433 Myrtle Street, New Britain, Conn. Include 50¢ for copy of Router Manual E12. Packed with know-how and show-how . . . over 100 illustrations . . . 40 fact-filled pages.

STANLEY **Electric Tools**

A Division of The Stanley Works

HARDWARE • TOOLS • STEEL STRAPPING • STEEL

"The memory of quality remains long after price is forgotten"

**HERE'S TIME-PROVED**
**"LIFE ASSURANCE" FOR YOUR PRODUCTS**

Pride in product is the common denominator of the hundreds of manufacturers who use Woodlife—and *only* Woodlife—to give their products basic protection against . . . . . *Moisture and water absorption, decay, swelling, shrinking, warping, checking, grain raising and termites.*

These manufacturers know that Woodlife quality is underwritten by over 30 years of continuing research in the most active chemical and testing laboratories in the water repellency field.

If you have pride in *your* products and don't know about Woodlife—*you should!* Protection Products engineers will be glad to work with you to develop the most economical Woodlife treatment method for your specific application. Send for the informative folder, "WOOD PRESERVATION WITH WOODLIFE".

*WRITE*

**Protection Products**
**MANUFACTURING COMPANY**
*Since 1921*
Dept. T, Kalamazoo, Michigan

# Carbide cutters at Marlin Firearms Co. outlast steel by 65 to 1 before regrinding

Carboloy cemented-carbide-equipped cutter heads in Marlin's Salstrom multiple copying machine turn walnut gun stocks at 7,000 r.p.m.; worked a full year before regrinding.

Turning black-walnut gun stocks at Marlin Firearms Co., New Haven, Conn., sent steel cutter blades back for regrinding every four days. When Marlin switched to Carboloy cemented carbide cutter tips, regrinding was cut to *once a year!*

Carbides can withstand the abrasive action of particles found in wood that ruin steel blades. Rough, uneven surfaces and "ironed" surfaces are virtually eliminated.

Marlin's experience with carbides on many applications over the past five years demonstrates the kind of money-saving, time-saving results you, too, can get. Ask your tool manufacturer for cutters, knives and saws equipped with Carboloy cemented carbide. Or send coupon today for additional information on the application of carbides to woodworking operations.

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company

**CARBOLOY**

**DEPARTMENT OF GENERAL ELECTRIC COMPANY**

**11128 E. 8 Mile Blvd., Detroit 32, Michigan**

Rush me, at no cost or obligation, Bulletin GT-206A, Maintenance and Operating Practices for Tungsten Carbide Tools.

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Company_____

Address_____

City_____ Zone_____ State_____

Leitelt Equipment can save many hard dollars in your plant and yard through more efficient lumber handling. For instance, the Leitelt Power Transfer Car operated by one man moves kiln car loads up to 30 tons with ease and safety. One man does a job that ordinarily takes the time and labor of five to eight men. Look around your plant or yard and see how many men are involved in handling lumber. If you are using more than one man or a Transfer Car it's time to call on Leitelt.

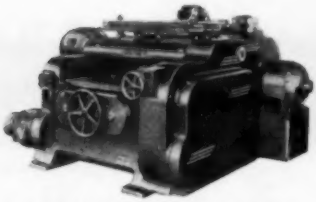
# SAVE Lumber Handling Dollars with LEITELT

*Write for full information on Leitelt Lumber Handling Equipment. We will be glad to advise the correct installation for your particular lumber handling requirements. Every installation pays for itself.*

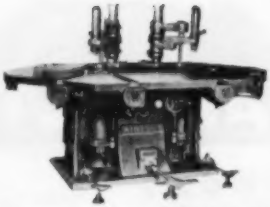
Manufacturers of Lumber Lifts Car Pullers Power Driven Turntables Subcars and Leitelt Swing Tables

**LEITELT IRON WORKS**
**400 Mill St., Grand Rapids 2, Mich.**

Notice in the installation below how one man handles a kiln load of lumber. The power Transfer Car does the actual work, whether it's pushing or pulling a load into or out of dry kilns or storage tracks.



**97 Double Surfacer** — For finest production planing. Direct Motor Drive. Feeds, 30 to 90 ft. per minute. Variable speed feed with Micro-feed Selector. Safety features. 30", 36", 40" and 44" widths.



**302 Automatic Shaper** — Double Spindle. Four Slide feature. Motor driven belted spindles. There's a Whitney Shaper for every shaping need. Send us your requirements.

Profits in the future will be made by those who plan ahead today — by modernizing their plants and replacing old machines.

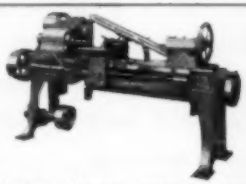
Whitney can help you to a big share of those profits because Whitney woodworking machines are designed for faster feeds, increased efficiency and with the stamina required to handle heavy schedules at lower operating costs.

Check your present equipment now. It may not be worn out but it could be costing you the price of new machines in slow, inefficient operation.

Let us help you with your problems. We will gladly furnish you with complete information on any Whitney production machine. Write, wire or phone for latest bulletins. BAXTER D. WHITNEY & SON, INC., Winchendon, Mass.

**600 New-matic Facer** — Eliminates waste in rough mill operation. Also for glued-up panels and cores. Rugged construction. Revolutionary design. A highly efficient machine. 24" and 36" widths.

**177 Tilting Arbor Variety Saw** — Totally enclosed, fan-cooled, motor mounted on arbor. The precision saw for quality production and all-around sawing. Low maintenance.



**Back Knife Lathe** — For low cost turnings up to 3" dia. 30" and 50" sizes. 3-speed V-Belt Motor Drive. Low installation and operational costs.

Whitney
FOR FINEST PERFORMANCE

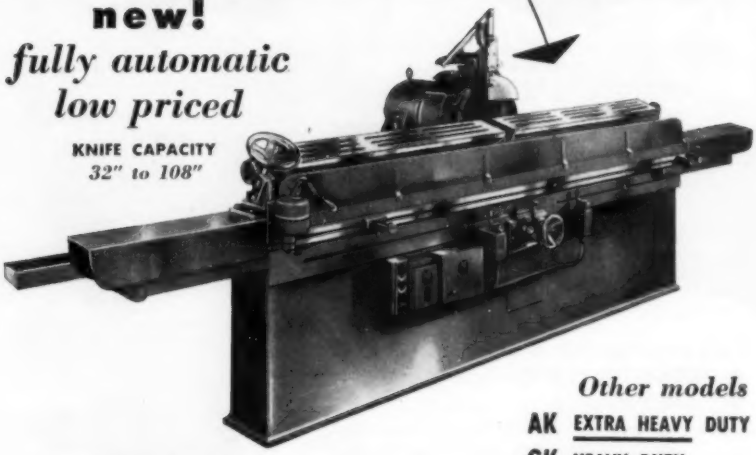
117 YEARS OF EXPERIENCE AND KNOW-HOW

# HANCHETT MODEL DN knife grinder

**new!**

*fully automatic*
*low priced*

KNIFE CAPACITY
*32" to 108"*



*Other models*
**AK** EXTRA HEAVY DUTY
**GK** HEAVY DUTY

## Model DN Features:

1. Timing belt drive. Positive — quiet — non-slipping.
2. Eliminates all gears (requires no lubrication).
3. Free from vibration and reversal shock.
4. 100% Anti-Friction Bearings.
5. Precision ground ways for accuracy.
6. Guarantees perfect machine alignment.
7. Force feed lubricated ways.

FINEST KNIFE EDGES

*Write for complete information*

**HANCHETT MANUFACTURING COMPANY**

*World's Largest Manufacturer of Knife Grinding and Saw Sharpening Machinery*

**MAIN OFFICE** — Big Rapids, Michigan

**WEST COAST** — Portland, Oregon

# THE HALLMARK

## of Quality

**Represented in the Entire Knife Line. And Introducing a New High Speed Steel Thin Knife**

## Stalter EDGE TOOL CO.

THIN HIGH SPEED STEEL

SHAPER STEEL

**TUNGSTEN TEMPER**

An entirely new and improved High Speed Steel Thin Knife is now being presented by the Stalter Edge Tool Company under the well known name of Tungsten Temper.
To provide a better knife Stalter has added an exclusive new NON-SLIP back. Metallurgical study has increased the edge strength. Order a set of Stalter Thin Knives and prove the advantages in your own plant.
The same new developments are incorporated in the Stalter Shaper Steel. The apex in shaper steel manufacture.

**TUNGSTEN TEMPER**

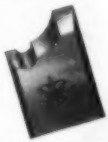
For use on modern fast moulders and stickers the Stalter Tungsten Temper (High Speed) or Thermo Temper (Carbon) provides the finest in slotted thick knives.

**THERMO TEMPER**

High Speed or Carbon Steel Planer Knives can be furnished to your specifications. Stalter Planer Knives can be supplied solid or inlaid. Write our engineering department for their recommendations.

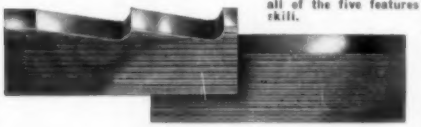
Tenon Knives furnished in High Speed or Carbon Steel, when made by Stalter, are the tops in durability, balance, and stamina.

Accurate interpretation of your patterns, ground into one of the selected Stalter Knives, provides you with trouble free operation. Send Stalter your pattern or sample.



Shaper knives made from Stalters premium shaper steel insures long lasting edges and safe operation.

Corrugated knives, ground-to-pattern, straight or bar length includes all of the five features of the Stalter knife making reputation and skill.



## Stalter EDGE TOOL CO.

GRAND RAPIDS, MICH.

# Glues that measure up to the Men Who Sell Them

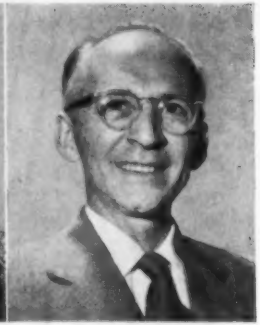
**National Casein takes the opportunity to salute the men who represent us—our salesmen.**

They're "Glue Men"—these men who bring National Casein glues to your attention—who take your glue orders—who follow through after our glues are delivered to be certain that they perform up to—or in excess of—the standards they claim for them.

We know what our salesmen say about National Casein glues—how enthusiastic they are over their quality—how certain our salesmen are that you couldn't buy better glues anywhere else—at any price.

So, rest assured you'll get from National Casein resin and casein glues that measure up to the men who sell them—glues you'll stick with because they stick for you.

**ROBERT A. (BOB) ETIEN**
Mississippi, Louisiana, Arkansas, East Texas. Former wood-working plant manager. Red-haired, fun-loving Air Force veteran with "ZOOM"



**O. B. (OBIE) DERR**
Pennsylvania, West Virginia, New York, New Jersey. A sales technician for 20 successful years. Infectiously enthusiastic and entertaining.

Thomas Cook

casein glues that measure up to the men who sell them—
glues you'll stick with because they stick for you.

Thomas Cook

DR. THOMAS H. COOK,
*For National Casein Glues*

# National Casein

601 W. 80th St., Chicago 20, Ill. • Broad and Fulton Sts., Riverton, N. J.

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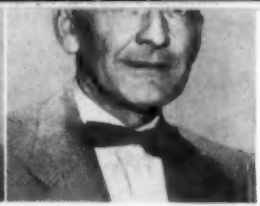
Virginia and the Carolinas. War veteran and veteran adhesive technician. Intelligent conversationalist, popular with customers.



**ARNO H. (MARTY) MARTIN**
Wisconsin, Minnesota, Upper Michigan, an adhesive technician for 28 productive years. Dean of National Casein salesmen—and a true fisherman.

**RICHARD S. (DICK) PORTER**
Ohio, Northern Indiana, Michigan, South Chicago. Adhesive sales and service technician. World War II bomber pilot. Pleasant, likeable product of North Carolina, suh!

**ROBERT W. ARCHAMBEAULT**
Iowa, Nebraska, Northern Illinois, North Chicago. Adhesive sales technician, World War II transport pilot. Happy, smiling, genuinely-liked American of French descent.

**WARREN H. MELL**
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**ROBERT E. (BOB) ALLEN**
Tennessee, Kentucky, Illinois, Indiana and St. Louis. Adhesive sales technician. Former woodworking purchasing agent, World War II vet. Congenial and capable—*he knows glues!*

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**medium . . . W-180**

single speed 20,000 RPM . . . and double speed 10,000 and 20,000 RPM. Light weight 24" x 20" cast aluminum table raises and lowers work.

## Onsrud® ROUTERS

**heavy duty . . . W-244 and W-304**

for every kind of production routing. Single or double speed, 10,000 and 20,000 RPM. Sliding spindle. Tables 26" x 36" . . . or 36" x 48".

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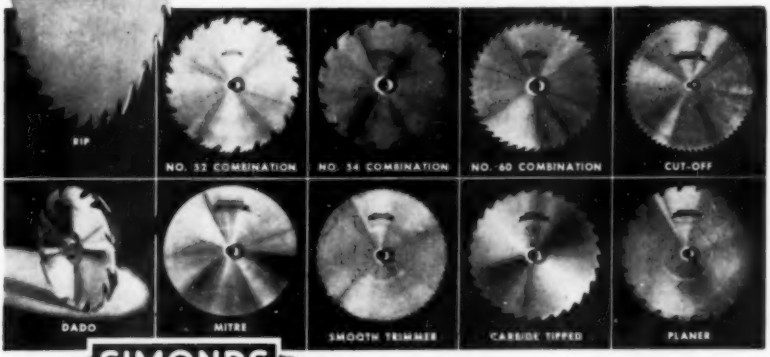


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*Permanent Displays: New York, Chicago, San Francisco, Los Angeles, High Point*

January 12, 1954

Mereen-Johnson Machine Company
Minneapolis, Minnesota

Attention: Mr. R. E. Johnson

Gentlemen:

At the request of Mr. Claude S. Sutton we are writing to give you a brief report on the performance of the two #400 M-J Tenoners we have had in operation for the last eighteen months.

In our opinion these machines have given exceptionally good performance from a quality and production standpoint. With the multiple "V" type Mereen-Johnson corrugated feed chains and quick chain snap-on dogs, accuracy of cutting and quick setups are accomplished. The two machines are both sturdy and the heads, motors, etc. well balanced, which permit us to run at maximum speeds and obtain uniformly accurate dimensions at the lowest possible unit cost.

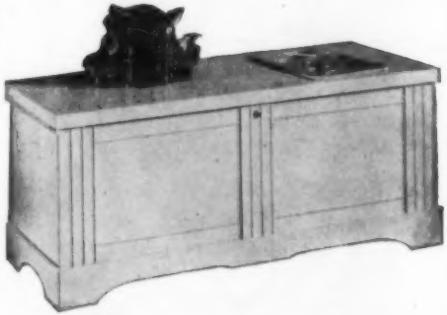
Our operators, foremen and plant superintendent are highly satisfied with the two #400 Tenoners and believe them to be very versatile production machines.

Very truly yours,

***"Maximum Speeds...***
***Uniformly Accurate Dimensions...***
***Lowest Possible Cost"***

**with our**

# MEREEN-JOHNSON NO. 400 TENONERS



Lane cedar chests are famous the

Our operators, foremen and plant superintendent are highly satisfied with the two #400 Tenoners and believe them to be very versatile production machines.

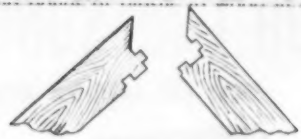
Very truly yours,

J. W. Brandon

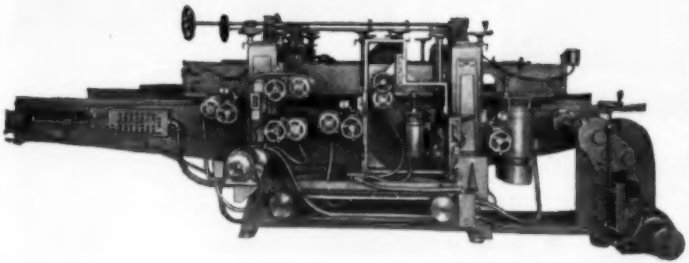
J. W. Brandon
Plant Manager

JWB:vlf

Lane cedar chests are famous the



Special Lane lock joint made with the No. 400.



★ **Rugged welded steel construction**

★ **Precision multiple V chain**

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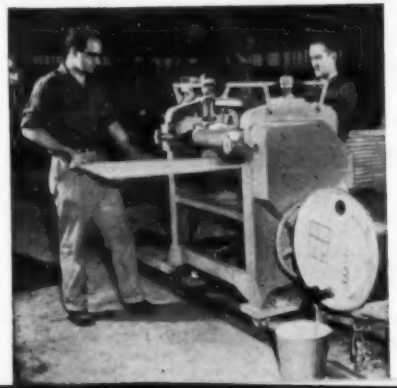
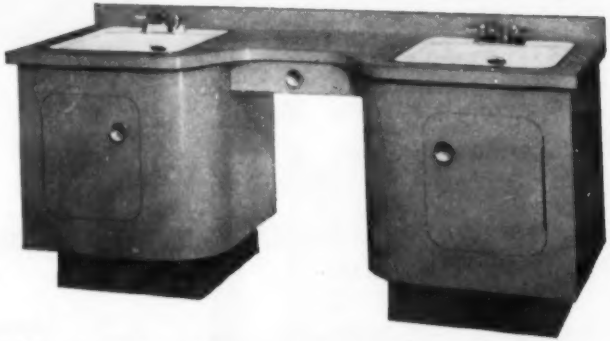
**KWIK-KLAMP 3048**

speeds the mass production of plastic surfaced Vanity Fair bathroom units at National Vanity Co., Kenilworth, N. J.





**ready-for-use resin gives**

## MACHINING BONDS IN 1 HOUR

is poured directly from drum and used

as 15 minutes . . . machining strengths reached in as low as one hour. No need

# MACHINING BONDS IN 1 HOUR

is poured directly from drum and used with no heating or mixing. A light, uniform film, applied by the glue spreader, is all that's needed to laminate plastic to wood.

as 15 minutes . . . machining strengths reached in as low as one hour. No need for long, expensive conveyor systems or drying rooms for curing. No glue heating or mixing to bother with. Use as is . . . enjoy daylong pot life. No irritating odor . . . cleans up very readily . . . send the coupon.

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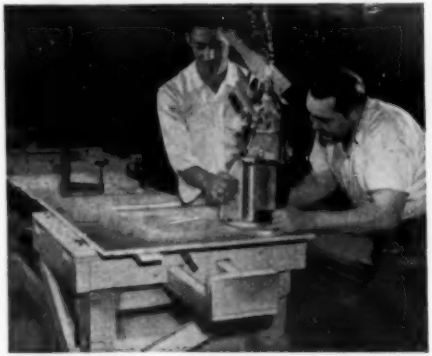
**RESYN 53R3049** is used by many laminators whose operations are geared to 2-3 hours clamp before cutting. Low cost, moderately fast setting. Resyn 53R3049 makes possible gluing, pressing and machining in the same day.



**KWIK-KLAMP 3048**

cold-sets in as little as one hour. The bond is then strong enough for machining on the router.

**KWIK-KLAMP 3048**

is also used for wood to wood bonds, such as cabinet joints. Low pressure clamps in background are removed after only 20 minutes.

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☐ **Send Plastic Lamination leaflet describing the KWIK-KLAMP process.**

☐ **Ship 5 gallons of National KWIK-KLAMP 3048. Bill at quantity drum price.**

☐ **Have National representative call to explain your KWIK-KLAMP production plan.**

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Company

Address

City Zone State

## cut costs and increase earnings with

# PORTER METHOD ROUGH MILL

***here's your guide to reduced costs with conveyorizing that fits any woodworking plant***

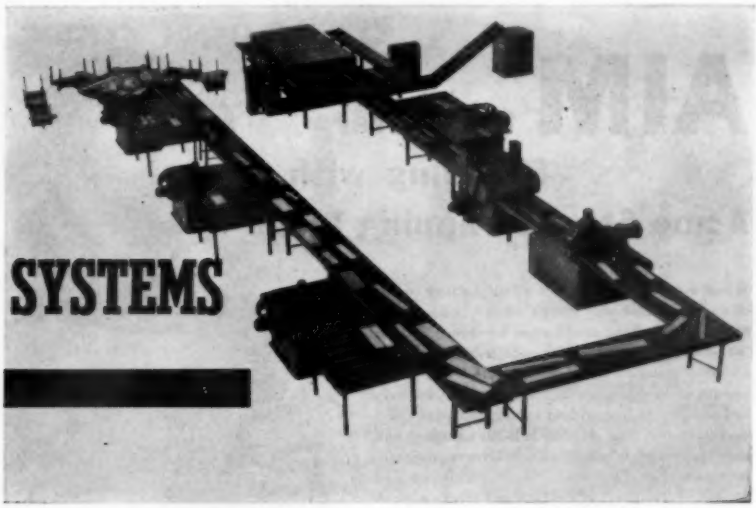
**PORTER pioneering**
has developed Rough Mill Systems that pay for themselves in economics effected by their installation.

**PORTER engineering**
meets each particular Rough Mill application. The floor plans of areas allotted for your rough mill operation, plus available machines are all that PORTER needs to make a proposed layout.

**PORTER construction**
PORTER SYSTEMS are rugged in construction. Formed channels are 3/16" steel, belt plates are 12-gauge steel; conveyor legs are 2" steel pipe — adjustable for height. Belts are top quality. Drive rolls operate on precision ball bearings. Motors equipped with overload relays and disconnect switch for protection of operator and motor.

**PORTER service**
PORTER conveyors move stock efficiently and economically between your machines, for maximum output. Your PORTER engineer is your constant consultant.

**PORTER savings**
Man-hours saved with the PORTER METHOD and equipment for Rough Mill operations are of primary interest to production-minded executives.




***and here's a typical set-up that frees nine out of sixteen men in a rough mill operation!***

This PORTER METHOD Rough Mill set-up conveyorizes corners to save space, frees nine out of sixteen men for other work.

Management's problem today is to reduce production costs. PORTER conveyorizing provides the answer. When you compare the footage to the man-hours required by the PORTER METHOD against the footage to the man-hours required with ordinary methods, you will discover how much more production with less man hours of labor you can gain, and how the total savings will more than pay for the cost of PORTER METHOD equipment.

***Send this coupon today for your copy of "More Board Feet Per Day"***

**C. O. PORTER**
**MACHINERY CO.**
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*Send my copy of "More Board Feet Per Day".*

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Title.....

Company.....

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# AIM* for Faster Bundling with Acme Steel Strapping Ideas

When a company produces a half million pieces of anything each day there's no doubt about the materials handling problem to be solved. Baker Wood Preserving Company, which daily produces 500,000 railroad tie plugs—among other wood products—turned to Acme Steel Company for help in bundling its tremendous output. For this Ohio manufacturer, Idea #405 means the company can keep pace and is prepared for further increases in production. This use of Acme Steelstrap and Strapping Tools is typical of Acme Steel's experience in solving shipping and materials handling problems.

Ask your Acme Idea Man for an on-the-job demonstration of Acme Steel Strapping methods. Or, write Acme Steel Products Division, Dept. CX-94, Acme Steel Company, 2840 Archer Avenue, Chicago 8, Illinois.

Ted Starr, Acme Idea Man in Columbus, Ohio, helped solve this high-speed bundling problem.

ask your *Acme Idea Man to help solve your problems

**AIM** *For Safer, Lower-Cost Shipping*

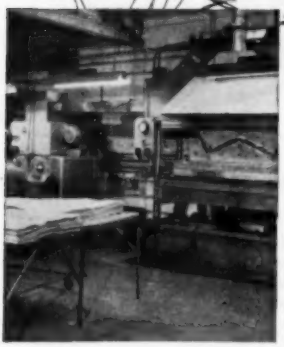
ACME STEEL

CUT HOURS TO

# minutes

WITH

Thermex
ELECTRONIC BONDING EQUIPMENT



When you convert to electronic bonding you cut bonding and curing time from hours to minutes. With THERMEX* Bonding Equipment you can greatly increase output and cut labor costs drastically.

Other advantages: You reduce floor space as much as 75%, simplify dies for short runs, and practically eliminate rejects.

Have a THERMEX engineer analyze your production to see how you can cut costs with this equipment. Write The Girdler Co., Thermex Division, Louisville 1, Kentucky.

*THERMEX—Trade Mark Reg. U. S. Pat. Off.

*This THERMEX Bonding Unit bonds and cures plywood assemblies in a few minutes. It eliminates need for expensive metal dies.*

The GIRDLER Company

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**MODEL 600**
**Single-Pad . . . Air Driven**

STRAIGHT LINE ACTION

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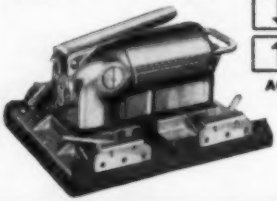

**MODEL 400**
**Single-Pad . . . Air Driven**

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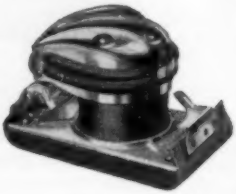

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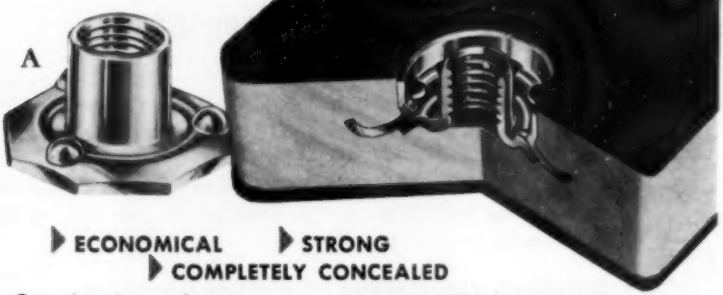
**RIGID, BLIND FASTENER**

*for K-D furniture and woodworking*

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The OCTOPUS fastener consists of a TEENUT (A) and sleeve (B). Sleeve is slipped over TEENUT and both are pressed into a bored or drilled hole with a simple setting tool. Sleeve prongs spread outward into wood and anchor the TEENUT securely. Result: steel threads in wood . . . and an easy-to-use, practical fastener to which parts can be rigidly attached by means of machine screws or hanger bolts.

Write for detailed, illustrated folder with full information on sizes, etc.

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# Now! A New Long Bed

## for lower cost . . . easier . . . safer operation

Brilliantly engineered—providing *big* jointer capacity at *small* jointer cost—this brand new Delta 6" Jointer gives you solid Rockwell-built Delta quality, *PLUS* new innovations that greatly expand the flexibility of your jointing-planing operations. It's a big, tough jointer—built to slash your production costs through greater usefulness—built to provide easier, safer operation. Dollar for dollar, your very best buy for general production woodworking.

## Look At These New Features:

1. **EXTRA LONG 42½" BED:** Insures a true cut the entire length of a long board. The longest jointer you can buy, dollar for dollar.
2. **UNIVERSAL FENCE ADJUSTMENT:** Single control handle positions the fence for both width and angle of cut. Engage positive 90° and 45° stops at a touch.
3. **IMPROVED TABLE ELEVATING MECHANISMS:** Conveniently located hand wheels, provide quick, easy raising and lowering of each table. With these controls you can't "skin" your knuckles!
4. **NEW SAFETY ENGINEERING:** Newly developed torsion spring assembly makes possible an adjustable tension guard—provides constant protection in any type of jointer work.

*The new Delta 6" Jointer provides these outstanding innovations—plus the accuracy and remarkable versatility that have made all Delta Jointers famous! See this beautifully built, cost-cutting Delta 6" Jointer at your Delta Dealer (he's listed in the classified directory under "Tools" or "Machinery") or send the coupon TODAY!*

ROCKWELL

# DELTA 6" Jointer...

DELTA
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DELTA QUALITY
MAKES THE
DIFFERENCE

**DELTA** QUALITY POWER TOOLS

Another Product by **Rockwell**

Delta Power Tool Division,
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☐ Please send me complete catalog information on the *new* Delta 6" Jointer.

☐ Please give me name of my nearest Delta Dealer.

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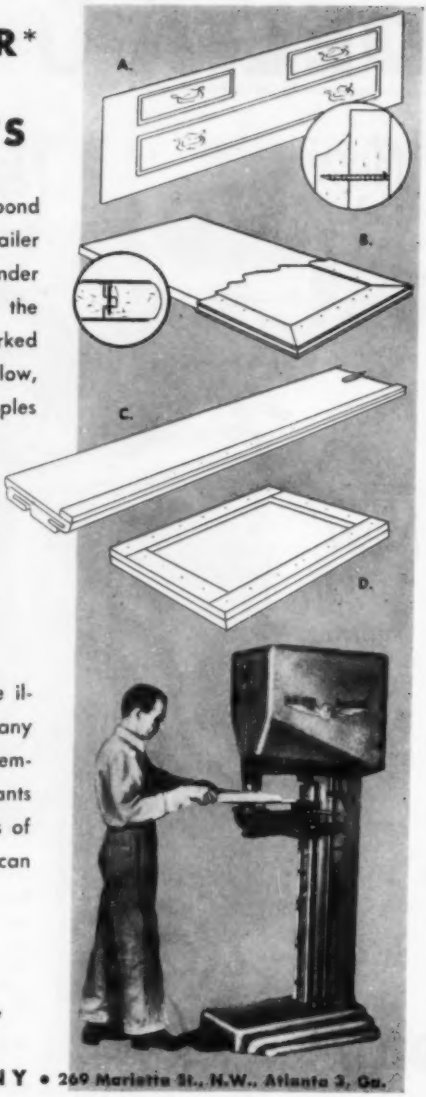
# AUTO-NAILER*
## IDEAL FOR
# GLUE JOINTS

A tight joint and positive glue bond are assured by using Auto-Nailer because the work is squeezed under 1000 pounds pressure. And the stock can be handled and worked while the glue is setting. No slow, costly clamping. A few examples are illustrated here:




**A. Glue-nail false drawer fronts to panels, invisibly.**

**B. Glue-nail rims to cores.**

**C. Glue-nail bed-rail slat-bearers.**

**D. Invisibly glue-nail bands.**

We will gladly send you the illustrated book which shows many more practical uses, now being employed by leading furniture plants and others. You will see dozens of ways this versatile machine can save money in your plant.

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**AUTO-NAILER COMPANY • 269 Marietta St., N.W., Atlanta 3, Ga.**

# We've Asked For It

Indirectly our industry is probably responsible for two problems we now face—labor costs and imported wood products.

A strike such as has crippled our northwest lumber producing area for many weeks helps to intensify these two problems. Industry is caught in a squeeze-play—satisfy labor and compete successfully with imports in order to sell and successfully hold the American market.

Average hourly wages in the lumber and logging industry are $2.16 per hour: unions demand a 12½c raise. At one time more than 103,000 workers were out on strike, including some 10,000 from the plywood industry.

Now nobody denies the value of hard, cold cash: we all like it. But in view of some of the facts, it would seem obvious that all along the line we have neglected the long-range view. Has management failed to keep lines of communication open so that labor knows just what competition is and how high costs have actually risen? Does the man out on strike know what can and may happen to the lumber market while he sits things out for 12½c more an hour?

This summer's strike is only one example of what happens to industry when management is placed in this precarious spot. At the same time that the American worker is demanding more, it is possible for the consumer to pay less for imported plywood, etc.

Last April more than 300,000 American workers had lost their jobs because of cheap imports. Anyone affiliated in any way with the hardwood plywood industry knows what a fight we have on our hands right now! (Read this month's "Comments From the Capital," page 35, to see actual facts and figures on this situation.)

Maybe we need a liberal dose of the philosophy everyone had in the black depression years—be glad for a job, any job. Nobody worried then if he were happy in his work or not; nor did we waste much time wearing out the carpet in the boss's office asking for a raise.

How about seeing the problems and doing something about them? We can't settle strikes. But having a job and doing a good job is pretty good insurance against recession. Can we help our employees realize this or does management, too, have a bad case of "gimme, gimme"?

We've asked for it, maybe unknowingly. But the present job is two-fold: 1. Write your congressman about the import situation and tariffs. 2. In our own plants, in our own ways, let's try for a different job attitude. Let's be as fair with labor as we want labor to be with us. A closer cooperation between boss and worker will make us stronger and better able to overcome competition from cheap imports and substitute materials.

E. McDaniel
Editor

**Your Triple Guarantee of**

# Profitable Lumber Handling

## MOORE "KNOW-HOW"

Good Lumber Handling begins with keen analysis . . . accurately assessing the job . . . possible savings in costs. Moore "Know-How" gives you honest, sound advice.

## MOORE ENGINEERING

Your Moore Sales Engineer and our Engineering Staff have spent years in daily contact with lumber handling problems. They do not guess at the answers—they know.

## MOORE EQUIPMENT

Look at the list—Moore Stackers, Kilns, Unstackers, Transfer Cars, Lifts, Swedes, Hoists—all manufactured in our four plants to meet your needs.

*Write for information on your lumber handling problem.*

**MOORE DRY KILN COMPANY**

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

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# *Comments from* THE NATION'S CAPITAL

**By Arnold Kruckman**
Washington Correspondent

Editor's Note: We hope that our readers will do more than just read this Washington report. We strongly urge that you write to your congressman on subjects which affect our industry.

Last April it was authoritatively stated that over three hundred thousand American workers had lost their jobs and that over two million American workers had been compelled to accept the wages of reduced hours, as a result of the flood of cheap imports coming from Europe and Asia. The same authoritative sources today calculate that over a half million American workers are out of jobs, and that at least five million American workers have been compelled to accept reduced hours. An organization, covering industry, agriculture and labor, on the export- import policy, including over fifty industrial groups, is pressing insistently for adequate protection against cheap-labor foreign products.

In some areas the distress is acute. In one state a major small industry, producing ceramics, has been closed down entirely after 150 years of operation, and the town naturally is suffering. It will be recalled when such potential result was pointed out as probable at Gloversville, N.Y., the response was that those who lost jobs in one industry could easily find them in another. The workers in the ceramic industry have not found it possible. They very frankly have been told that their skills are not useful in the work where they seek new employment.

Of course, in most instances, the smaller industrial groups integrated in smaller firms are hit most quickly and most unhappily. People who make and trade in many products have been amazed to learn the numbers that have been thrown out of work in the various individual industries. It is significant that government agencies, themselves, which keep close watch over industry and labor, make the most vigorous protest. They very candidly state that all but a negligible part of this reduction

in production, and in work for hundreds of thousands, is entirely unnecessary assuming that we should permit foreign producers to take care of their own troubles and should put them on an equal competitive basis when they come to this country with their wares.

It is well known in government that products are brought in from Finland and Germany—hardwood plywood—which, after the cost of carriage and tariff and other expenses of export, are sold in the American market at one-third of the price which the American producer must obtain in order that he may meet the standards of every social and economic definition of the American people. Still lower are the identical products which are brought in from Japan. The Finnish and German producers are well organized in their method of merchandising in this country.

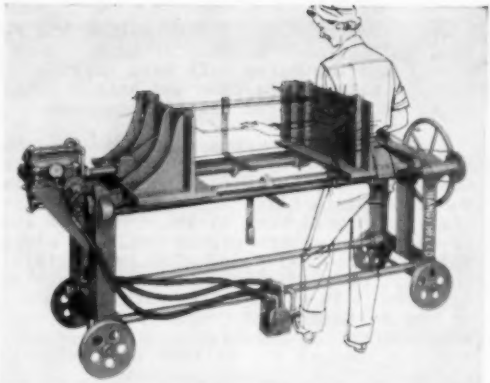
The Japanese, on the other hand, literally have thousands of small agents who sell their hardwood plywood products in the U. S. It would not be surprising if they were competitive with each other and thus reduce even lower the prices of their wares in competition with American products. Anyone who has dealt with Japanese industrialists or commerce is fully aware of the fact that the competition among the Japanese themselves is just as cut-throat as is their competition with those of other countries.

At the present time the Japanese are preparing an operation which will cost American industry even more than it does today, unless American industry awakes and takes the necessary steps to impel its government to protect it. As the people in the woodworking industry know well, the Philippines have what is called a hardwood which the Federal Trade Commission permits to be sold in the United States as Philippine mahogany. This wood is the primary basis of the Japanese hardwood plywood industry today. It is brought from the Philippines to Japan in non-Japanese bottoms. The important element to consider is the fact that the Japanese are gathering themselves to operate their own shipping, and to bring the Philippine mahogany to Japan at the vastly reduced cost of shipping operated as a part of their industrial chain.

European competition comes from all parts of that continent; but Asiatic competition comes almost solely from Japan. The rest of Asia has no genuine industrial system or commercial philosophy. The point may be illustrated by the fact that this correspondent had occasion to discuss an important commercial problem with one of the Southeastern Asiatic ambassadors. After he made his appointment, and before he made his visit, he was warned by a friend in the State Department that the ambassador would be a charming and ornamental gentleman in his alien robes, but that he would have no more understanding and knowledge of industry or commerce than a child in an American grammar school. The Chinese are traders but do not yet really have any understanding of industry in the sense that we know it. It is the Japanese who understand mass production, modern science, who have modern machinery, and who really understand Western ways and means. They have kept their labor cost down to a point where it is almost insignificant. You can again get a better

# Do you make every drawer 3 times?

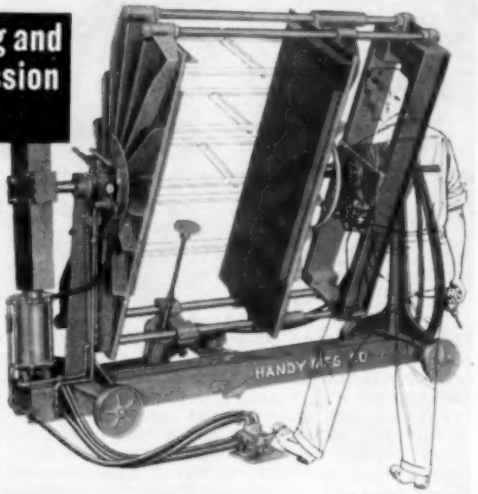
Do you bench pre-assemble, then squeeze in a clamp, then do a lot of costly drawer fitting? Now, the *No. 43A Handy Air-powered Drawer Clamp* makes it easy and fast to turn out accurate, square drawers without pre-assembly, and fitting is reduced to a minimum. After quick set-up, the operator simply places the drawer parts in the Clamp, and, in a single or dual operation, makes you better drawers. Down go costs on any quantity.



*In your Cabinet Room*

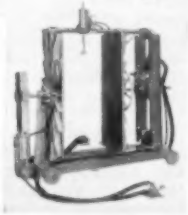
# New Power Steering and Automatic Transmission put you out front

In your new car power-aids are pure pleasure; in cabinet and case assembly this engineered power yields dollar profits. Power revolving, power clamping go to work for you with the new *No. 410 Series Handy Case Clamps.* Optional power top-pressure, too, with exclusive Handy Hollow-bore cylinders doing the work fast and true. Your cabinet makers always have full control of clamping speed and pressure and revolving. To men responsible for production and lower, competitive costs, Handy Full-powered Case Clamps are today's buy that pays.




handy MANUFACTURING CO. ESTABLISHED 1903

**This is worth checking into right now. Write, wire or phone.**



*HANDY Manufacturing Company*

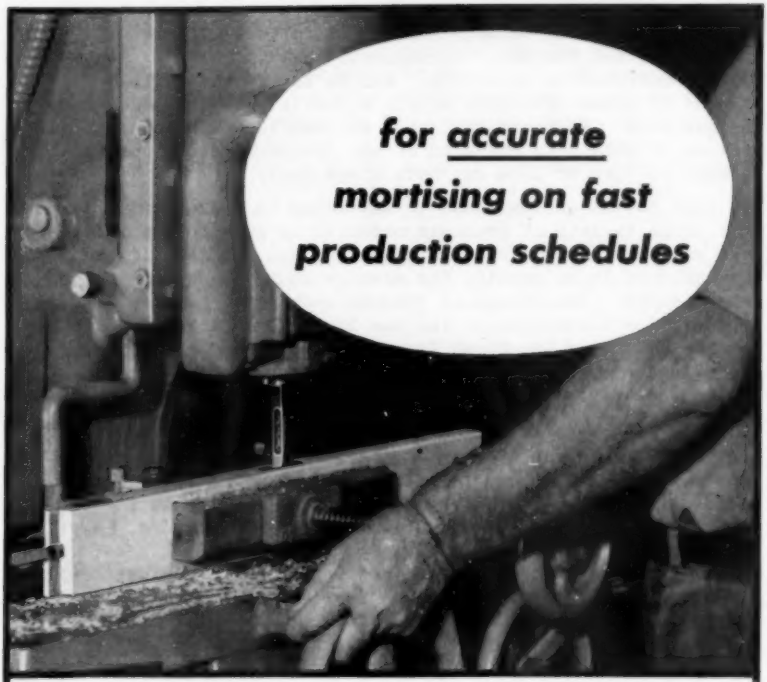
**2436 West Lawrence Avenue • Chicago 25, U.S.A.**

understanding of the Japanese when you realize why they are regarded as the Prussians of Asia. They are a blending of the Mongol and the Malay. In Asia they tell you you can give a Malay a pile of tin cans and an old motor and he'll turn out an entirely new and functional apparatus.

As is known, between 60 and 70 recommendations were sent to the White House by the U.S. Tariff Commission urging that the tariffs in each specific industrial instance be lowered. There was a complete blank in response from the White House except early in August when it was announced that the recommendation to exert the escape clause would be adopted in relation to Swiss watches. The Swiss industry immediately strenuously protested and implied retaliation of some kind. While this had a play in the news it is strange that nothing was said about what had happened to the Waltham Watch Company, one of the oldest popular-priced watch-producing organizations in America. The Swiss competition actually forced the Waltham people to close their factories and virtually to go out of business in meeting the market for low-priced watches. The presumption is that they will be able to resume business if the ruling from the White House meets their needs. It will employ a great many technically-trained workers. The chief excuse for permitting the collapse of the Waltham Company was that their trained personnel were needed in defense work.

When the final conference report on the general tax revision bill went to the White House it had these revisions of primary importance to smaller business: (a) The 52% corporate rate was extended until next April 1; (b) accelerated depreciation is permitted for assets having a service life of at least three years if construction is completed and put into use after December 31, 1953; any portion completed after that date, with the new code, will permit the taxpayer to switch from the declining-balance to straight-line depreciation at any time during the life of the property; (c) higher percentage depletion allowances are permitted for some expenditures which may be deducted in one year; (d) partnerships or proprietorships of a certain size may elect to be taxed as corporations; (e) the net corporation loss carryback is extended from one to two years making an eight-year average period for absorbing losses; (f) research and development expenditures may be deducted either as a current expense or amortized over longer periods;(g) an earnings credit of $60,000 is allowed under the revised surplus accumulation provisions while the penalty tax is to apply only to that portion of retained earnings deemed unreasonable; (h) a speed-up in corporate tax payments for corporations whose annual tax liability is $100,000, or greater beginning after December 31, 1954; (i) a dividend credit of $50, plus an additional credit of 4% up to a limit of 2% of taxable income in 1954, and 4% in later years.

One of the most alert businessmen of our acquaintance remarks "re-check at once all your plans for replacing equipment and expanding your plant. There will be a big speed-up in the rate for writing them off. Can this speed-up in your case apply to capital outlays already made but not yet fully written off?"

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Fast-clearing, long-lived GREENLEE Hollow Chisels and Bits add speed and accuracy to the production and assembly of your products. Made by the originators of the hollow chisel mortiser, these high-quality tools make "clean" mortises easily, swiftly, economically.

Available in a *complete* line for hard or soft wood and all makes of machines. Write today for new illustrated Catalog 34-M describing these and other GREENLEE tools for mortising, boring, and routing.

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**GREENLEE TOOL CO., Division of Greenlee Bros. & Co., 2139 Harbert Ave., Rockford, Ill.**

Tools for boring, routing and mortising • Hollow Chisel Sharpeners • And many others
Mfrs. of Teco Grooving Tools for Timber Connectors • GREENLEE Woodworking Machines include Tenoners • Saws • Mortisers • Borers • Planers • Shapers

He also emphasizes you will now be able to choose your own business accounting methods instead of following those arbitrarily set for you. He suggests that businessmen study these possibilities carefully. And he thinks that simple changes in stock ownership within a family can save money under the new rule. He hints that it's worthwhile determining to what portion of 1954 does one kind of new dividend relief apply, and to what portion of 1954 can both kinds apply.

The cut in excise taxes is estimated to reduce sales taxes on a large variety of consumer products by more than $1 billion. Most manufacturers of household appliances, cut from 10% to 5%, are reported to be passing the savings on to consumers to spur retail sales. Congressional friends emphasize the more liberal depreciation allowances of the new law will be invaluable to new businesses during the first five or ten years of their life. The burden of proving that corporation accumulations are "unreasonable" is shifted to the government.

The Chamber of Commerce of the United States points out that a Norwegian employed in Norwegian woodworking industry, took employment with a Dutch firm. He was arrested by Norway, tried, utterly prohibited from leaving the country in the future, or accepting employment with foreign employers, heavily fined and his earnings were confiscated. Norway's highest court rejected his appeal. Norwegian newspapers and organizations are aroused about the incident. They consider it as initiating conditions amounting to serfdom. They point out if the principle is established it will make an employee in any profession or industry a complete serf, and therefore, in effect, a bond slave. They point out it is one of the fundamental principles in free countries that the individual has the liberty to leave his own country and pursue his trade, or business, in any other country with which his own country is at peace, and to which he is welcome. The Norwegians, largely like the Americans, stem from the races that produced the Vikings. They are freedom-loving like the Americans. It is pointed out that if they can be the victims of such a perversion of their constitution that the same thing may happen to Americans. It is a fact that the right to leave the United States is becoming more difficult, and the privilege of obtaining a passport is far more circumscribed.

A dual ceremony at the White House the first week of August made Norman P. Mason Commissioner of the Federal Housing Administration, and created as law the Federal Housing Act of 1954. The President administered the oath of office, and signed the Act.

Mason, for a considerable time, was Chairman of the Construction Committee of the Chamber of Commerce of the United States. He says the new law will require smaller down payments; extend the maximum mortgage terms in all cases; and increase the amount of mortgages which may be encouraged. Also, it permits more liberal mortgage insurance for existing homes. It provides for "open-end" mortgages.

Adminstrator Albert M. Cole, head of the Housing and Home Finance Agency, the over-all directing force of the Federal Housing Administration, and other allied agencies, points out that rehabilitation of homes, provided in the new law, is a completely new development in the nation's housing concept, and will, in time, arrest the blight in communities—the blight which is the first step inevitably leading to the creation of new slums.

The Atlantic Mill Work Institute, the Nationl Woodwork Manufacturers Association, the Southern Sash and Door Jobbers Association and the Wood Work Jobbers Service Bureau propose Commercial Standard CS190-53 which covered standard stock double-hung wood window units. Under test since January 15, 1953, the Standard apparently has now been adopted by the BDSA, and printed copies of the Standard may be had from the Commodity Standards Division, Office of Technical Services, U.S. Department of Commerce, Room 6225 Department of Commerce Building, Washington, D.C.

The National Inventors Council, U.S. Department of Commerce, Washington 25, D.C., has announced publication of discussions which include wood that is used as structural sandwich material; and the development of objects with low-radar reflectivity and housings for radio and radar antennae. The bulletin also announces the need by the Armed Services for a lightweight expandable pallet made of wood, approximately 40" x 48" in size and to be capable of withstanding a minimum load of 1,500 pounds per pallet and, when stacked four high in warehouses, a load of 7,500 pounds on the bottom pallet.

The pallet is to be capable of withstanding an average minimum of 16 handlings, and to be capable of withstanding temperatures of from 125° F. to minus 65° F. under operating conditions, and temperatures up to 160° F. for a period of four hours, and maximum low temperatures of minus 80° F. in storage. It is suggested the weight preferably should be less than 75 pounds to 100 pounds and cost less than approximately $1.75 of the cost of wood pallets.

"Directory of U.S. Government Specifications for Wood Products," listing the products and the Agencies, has been issued by the U.S. Army Corps of Engineers and the Timber Engineering Company, 1319 18th Street, N.W., Washington 6, D.C.

The furniture barometer is rising! Consensus is that aggressive manufacturers and retailers will book substantial volume during the remainder of the year. Most industry indicators favor a rise. Radio and TV sales are sure to start upward this fall.

*The lumber strike which began June 21, is of real concern to us all. We wish that every striking woodworker could read this month's "Comments From the Capital." In view of the competition facing our lumber and plywood markets it seems obvious that now is the time to preserve the industry and our very jobs.*

Where acoustical qualities count, wood is the preferred material. Durability and beauty are other factors which help to promote its almost exclusive use in the production of hi-fidelity equipment. Fine woods and veneers lead in the production of TV cabinets, pianos and most musical instruments.

*We have just read again the entries which were submitted for the First Annual WOOD WORKING DIGEST Award of Merit Contest. Resumés of the winners' entries will appear in the WOOD WORKING DIGEST DIRECTORY—to be issued in early fall. The work being done by some companies and organizations in the promotion and general education of wood is very fine. If each one of us would do our part along these lines, "We'd have more business in a hurry and none of us would have to worry." (Quotation is from the Great Eastern Lumber Corp.)*

Finishes and designs in the field of piano manufacture have changed very little in the last year. Light woods hold about 40% of the field while mahogany rules in both light and dark finishes. Spinets still hold top place.

# LET AIR *do your TACKING WORK*

## DUO-FAST *Direct Drive* AIR TACKERS

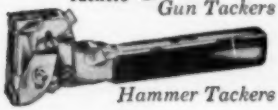
**12 Models**
Including the One
**To Speed Your Job!**

Users of these Direct Drive Air Tackers report remarkable production increases over former tacking methods. That is because these tackers are so fast, efficient, and easy to use. Women and non-skilled men workers can do a top quality job with Duo-Fast Air Tackers. Why not let air do your tacking work?

**Also Available**

A complete line of DUO-FAST Manually-operated Tackers

*Gun Tackers*



*Hammer Tackers*

**Send for the timesaving, moneysaving facts on Duo-Fast Automatic Tackers.**

**FASTENER CORPORATION** 860 FLETCHER ST. CHICAGO 14, ILL.

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*Home building shows no signs of faltering and we can look for starts equal to last year or better in the coming fall months.*

A book, new to us, comes to our desk as we go to press—"The Manufacture of Veneer and Plywood." It is written by V. J. Rinne and has been published in Finland. It describes European manufacture, but is interesting to read and offers some helpful information. Write for the address if you are interested in purchasing the book here in the United States.

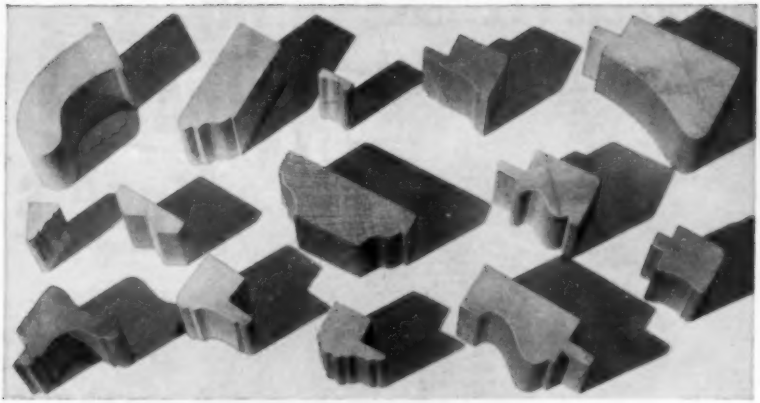
*When in Washington, D.C., you will be able to see progress on the housing center. This National Housing Center, estimated to cost $2,500,000, is to be located in midtown and will be the world's greatest show place of modern housing progress. It is to be completed in May, 1955, and will serve as headquarters for N.A.H.B. Exhibits on seven floors will cover the entire field of home building and will be changed as necessary to keep abreast of new developments. Neal J. Hardy has been appointed director of the center.*

In mid-summer the American Institute of Decorators met in Chicago. An exhibition, "At Home In America 1954," was sponsored by the organization and more than 24,000 people visited this display. Wood received strong emphasis in both room backgrounds and furniture. Against rough competition of expensive promotions by large manufacturers of competitive materials, fine hardwoods more than held their own in furniture, flooring and paneling chosen by decorators. Wood, one of the oldest materials, is also one of the most beautiful and versatile for contemporary interiors.

*The Maritime Administration reports that only two days are required to assemble new standard, demountable, wood gangways for 120 Liberty-type ships being converted for grain storage. Success of this initial installation has resulted in a decision to go ahead with these gangways on 500 ships in the south. These gangways will require more than one million b.f. If the entire 1500-ship storage program is completed, more than 2,850,000 feet will be used.*

The Hardwood Exhibit at the Chicago Museum of Science and Industry is now over a year old. Have you seen it? If not, make it a "must" on your next trip to Chicago. Excellent publicity has helped to acquaint the public with the exhibit and emphasize the inherent advantages of wood in the home and within industry. It's working hard to sell more hardwoods by showing America that wood is beautiful, useful and durable.

*Latest use for plywood! In Paris you can buy a wooden bathing suit. Designer Reard's newest creation—called "plywood"—is made of mahogany and sycamore plywood. The suit is kept clean and sparkling with floor polishing wax.*



# Longer-lasting 3M Garnet Cloth Belts sand any moulding shape better, faster!

Note the intricate contours of these mouldings, the sharp "knife" edges and valleys. Sanding shapes like these is a tricky job—done perfectly with 3M Garnet Cloth Jean belts.

3M Garnet Cloth belts are faster-cutting than ordinary mould sanding belts, and longer lasting. Reason for this is superior grain anchorage, making them resistant to mineral peeling, the commonest problem in mould sanding.

And 3M Garnet Cloth belts are more conformable—they flow smoothly over a "knife," retain their shape far longer than ordinary belts. Perfect for fixed, hand or automatic sanding, they require only light pressure because of their extra sharpness. The *belt* does the work.

Yes, for any mould sanding job, you'll be money ahead with 3M Garnet Cloth Jean belts—longer-lasting, faster-cutting, more conformable than any other moulding sander belt on the market today. Be sure to specify 3M every time you order. For further information send for booklet "3M System of Furniture Finishing," using coupon below.

*The final finish mirrors all previous operations*

3M ABRASIVES

Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch" Brand Pressure-Sensitive Tapes, "Scotch" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing.

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☐ *Send me the booklet "3M System of Furniture Finishing"*

☐ *I'd like to talk to a 3M Salesman*

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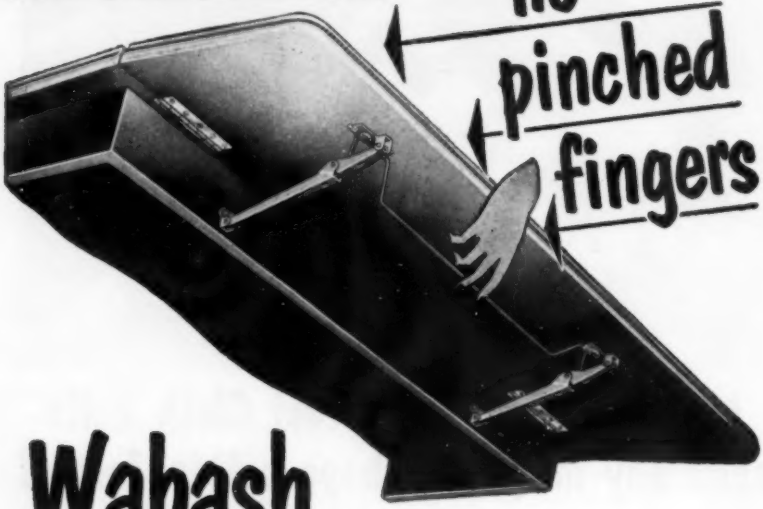
NEW SALES FEATURE



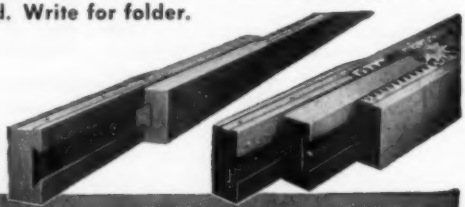

# Wabash

## DROP LEAF SUPPORTS

### WITH DUAL RELEASE

ADD REAL customer appeal to your tables with this new convenience! It's popular with the housewife . . . pleases everyone with its smooth operation. Inexpensive, installs with leaf supports . . . no extra labor needed. Write for folder.

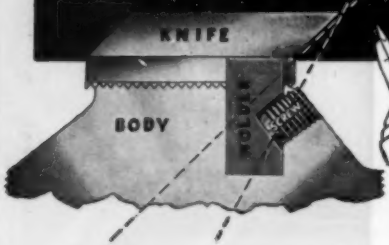
**WABASH SLIDES**
With or Without Equalizer,
also Folding Leaf Equipment
and Top Locks



B. WALTER & CO., Inc., WABASH, INDIANA

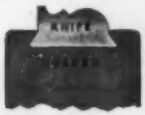
*Walter of Wabash*

# "3 reasons why I specify Jones & Orth cutter heads!"



*Here's why a Jones & Orth H-Type Head is a better buy for your money!*

1. **QUALITY OUTPUT!** No change of pattern or cutting angle as you take up for knife wear!
2. **SIMPLICITY!** Fewest possible number of parts without sacrifice of top performance!
3. **LONG LIFE!** Proven designs, with finest steels, precision machined, assure durability!



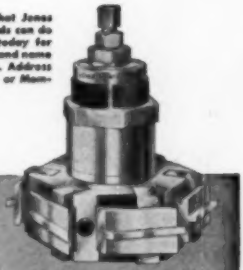

**ABOVE** diagrams show how a knife is moved forward to take up for wear, yet without change of cutting angle. **LEFT** diagram shows positive, safe grip of knife by the holder.

## *"No other cutter head gives us all these, —plus Service!"*

In buying cutter heads, the voice of experience speaks for Jones & Orth as the BEST all-around buy in the field.

Side-by-side comparison of operating results again and again confirms the quality, durability and over-all economy of Jones & Orth cutter heads.

*Find out NOW what Jones & Orth cutter heads can do for YOU! Write today for our latest catalog and name of nearest dealer. Address either our Seattle or Memphis branch!*



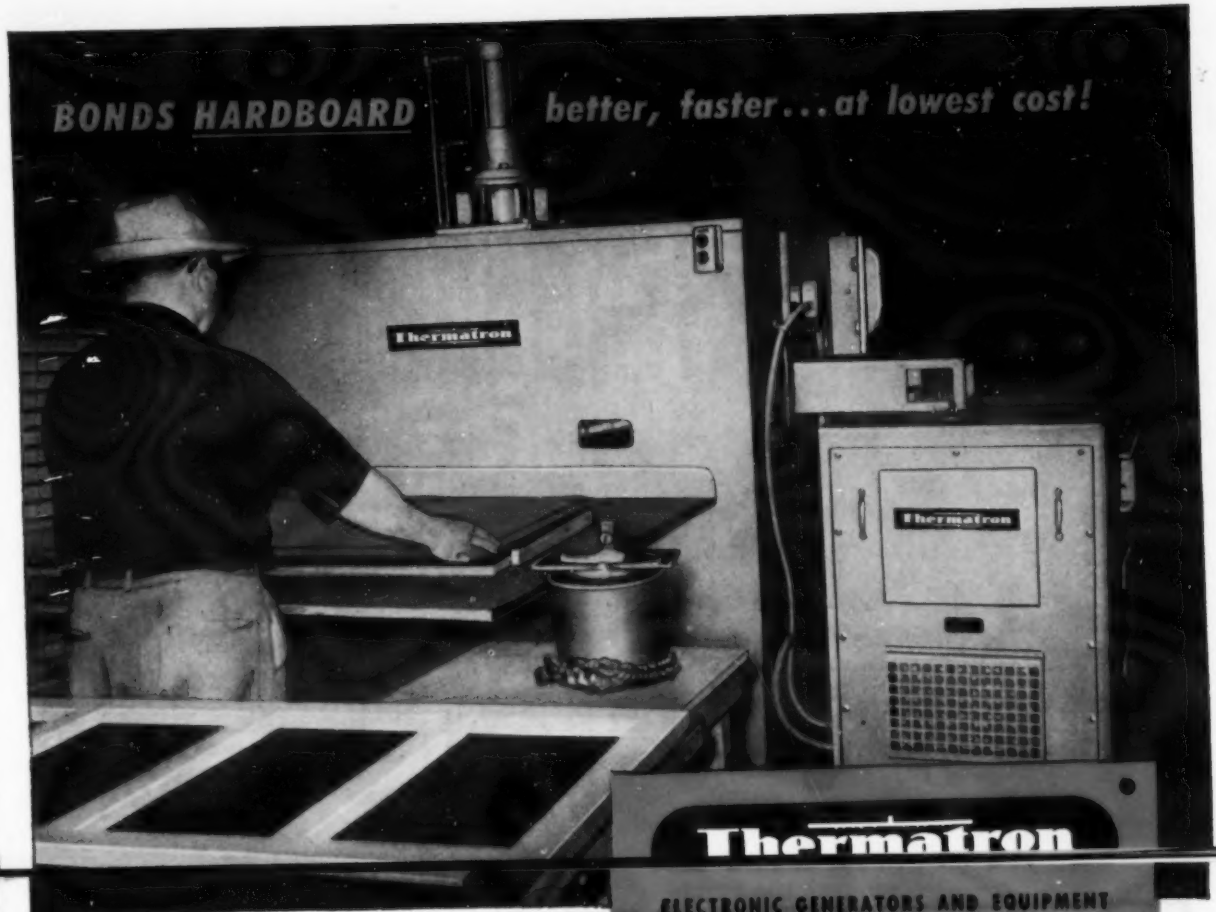
# JONES & ORTH

**CUTTER HEAD COMPANY**

385 SOUTH MAIN STREET
MEMPHIS 3, TENN.

BOX 3064
SEATTLE 14, WASH.

*Need specially designed cutter heads? Let our engineers help! Write us in detail. Prompt service!*


BONDS HARDBOARD better, faster...at lowest cost!
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ELECTRONIC GENERATORS AND EQUIPMENT

Tempered hardboard can be successfully bonded with THERMATRON electronic generators and hydraulic presses—combining the best, fastest and most inexpensive method of gluing with the best and cheapest wood-material on the market today! The variety of products is practically limitless with new uses being discovered daily . . . from radio and TV cabinets, furniture and displays *to houses and even vehicles!*

If you're fabricating tempered hardboard or planning to do so let us show how the THERMATRON way of bonding can benefit your production. We'll offer suggestions and application engineering without obligation. Write us today for complete details and ask us for our instructive bulletin no. WD37.

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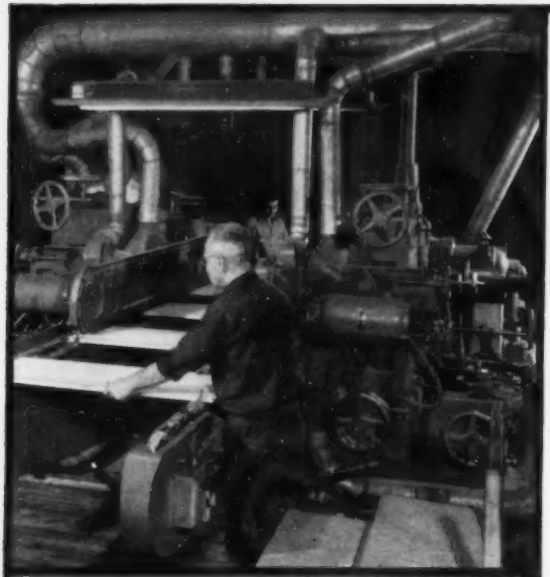


## "WOODWORKING PLANT IN ITSELF"

**Greenlee Double-End Tenoner cuts costs fast**

Many manufacturers have increased production, refined the quality of their products, and reduced unit costs substantially with a GREENLEE No. 545 Double-End Tenoner. This versatile machine performs many cost-cutting operations. It holds exact sizes over long production runs, thus eliminating costly "hand fitting" methods. Often referred to as "a woodworking plant in itself," it takes the place of several single-purpose machines and results in a highly streamlined, efficient production flow that produces finer products . . . in less time . . . at less cost . . . to meet today's market demands.

Write for Bulletin No. 545 **GREENLEE BROS. & CO.**
1869 Twentieth Avenue, Rockford, Illinois

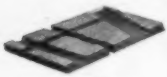
**TYPICAL EXAMPLES OF WORK PRODUCED ON THE GREENLEE NO. 545 DOUBLE-END TENONER**

Dadoing, scoring, dovetailing, notching, relishing, sillhorning, and irregular shaping are among the 15 separate operations performed.

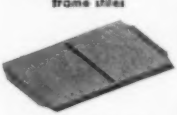
Mitering furniture rails

Dovetail jointing furniture rails

Cutting lock corner joints



Dadoing window frame stiles



Blind dadoing and relishing panels

Beveling and cutting clamp nail grooves

Sizing, tenoning, and coping door rails

GREENLEE

# SKILLED *Workmen* PRODUCE *Fine Furniture* For Oxford, Ltd.

**By Darrell Ward**

OXFORD, Ltd., a sister plant to Kent of Grand Rapids, occupies buildings at 1666 North Throop in Chicago, where John J. Dombrowski superintends plant operations under Harry B. Kulp, president; George B. Klyn, vice-president; and, Ed Novak, secretary of the company.

The plant has been in Chicago for 12 years altogether, 3 in its present location. Oxford produces many varieties of tables, upholstered chairs and wood chairs with leather or fabric coverings. They supply Kent with all veneered work for cabinets and chests made in Grand Rapids.

On our tour through this plant, we were impressed with unique observations which were clarified later at an interview. All operations seem to run as smoothly as a spaghetti factory, yet no one seems to be exerting himself more than normal routine would require. Most of the workers are elderly people, apparently happy with their performance of highly skilled tasks.

Modern machinery appears in every department, yet the layout is not so tightly packed that every inch of space is utilized for efficient production. The fact is, there is more unoccupied space than otherwise. However, operations appear to be going full blast.

A group of period pieces, beautiful enough to command respect from an art critic, was found waiting in line at the finishing department. But, no warehouse full of finished furniture was waiting for shipment. Such a warehouse doesn't even exist at Oxford. Sales do not permit it.

The smooth-running operations may be attributed to more than one factor. Up-to-date machinery is one. Well-trained workers is another. Good supervision, notwithstanding Mr. Dombrowski's modest denial, stands out immediately.

Efficiency in most departments might be attributed to the elderly people whose skilled hands Dombrowski would not like to lose. This came to light when he told us that it is next to impossible to hire younger men. He said the average age of workers in his plant ranged from 55 to 60 years!

The problem of getting skilled labor, or hiring young people for training, seems to be more acute than any other production problems. Even with good wages and pleasant working conditions, new employees are hard to find. Dombrowski said there are no training programs in line with his needs, so young people, who might be interested, lean more toward other work—or get drafted.

He has attempted to get young ex-G.I.'s or other people through the employment agencies even for on-the-job training, but there has been little re-

**Raw materials enter door at far right from yard. Cut-off sawing is first step. Facing of both sides, and joining of both edges is one continuous operation up to man in foreground at receiving end of machine group.**

sponse to his efforts. Woodworking labor is a tight situation, according to Dombrowski, but upholstering labor is almost impossible to find.

One would imagine that manual training given in high schools would encourage more interest among young people, but Dombrowski says the interest just isn't there. The only young men in his shop are boys in the veneer department. It took him two years to pick up these four young fellows and train them in the work.

His greatest concern is what might happen in 10 or 15 years from now when his older men die off, or retire. So far, it has been out of the question to make definite plans for replacements. He hopes that the ending of the Korean situation may help to some extent.

He believes that this turn in world affairs may ease the business dilemma in two ways. It might make more men available, and it may cause a recirculation of money and greater demand in furniture for the new family units bound to crop up.

Present sales exceed production. A happy thought, except that the labor situation is a deterring factor behind production. This accounts for some of the wide open spaces between machines in the plant layout. Dombrowski could fill in much of this space with machines, jigs and fixtures—if enough people were available to keep them running.

**Core stock is laid on clamp bars after hot glue is applied to edges. Machine holds plates rigidly clamped for a full cycle of hour to two hours while glue sets.**

**First operation in veneer department is clipping. Note that boys in this department are the only young men in plant.**

Only part of the 187,000 square feet of floor space is required for production of the 2,000 or so units turned out each month.

Unlike many plants, Dombrowski is not faced with the problem of maintaining sufficient warehouse inventory of finished merchandise, nor is he plagued with an oversized inventory to reduce. Everything is finished to order, just before a shipment is ready to go. Production is kept in full swing with the rather limited personnel, running somewhat short of current sales potential.

**Solid parts go from rough mill directly to finish mill where major operation is band sawing and multi-spindle carving. Four Moak band saws are kept busy here roughing out parts for other operations.**

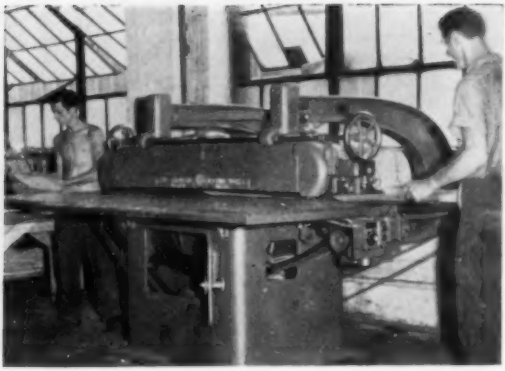
Dombrowski conducted us on a tour of the complete processing through all departments. He used a hypothetical table as a typical example.

Raw material is ordered in carload lots of a kind. As many as ten carloads may be found in stock at one time. Purchases include 5/4, 6/4, 8/4, and 10/4 solid hardwoods in random width and random lengths. Veneers are bought in full flitches.

Poplar is used for all core stock, while maple, elm, cherry, oak, mahogany and walnut are used for exposed parts. Veneers match whatever solid parts are used in construction.

Rough stock comes from the yard through a wide, drive-in door at the back of the plant. The cutoff sawing, face planing, and joining make one continuous operation through a built up arrangement of four machines which keep three men busy. Diehl machines are employed in the combination.

A Diehl ripper splits the pieces of stock, usually into 2½" to 3" strips for core pieces. Other dimensions are cut for solid parts of furniture. The width of core stock varies considerably, de-



**A Diehl splicer joins pieces of veneer into full sheets for various size panels.**

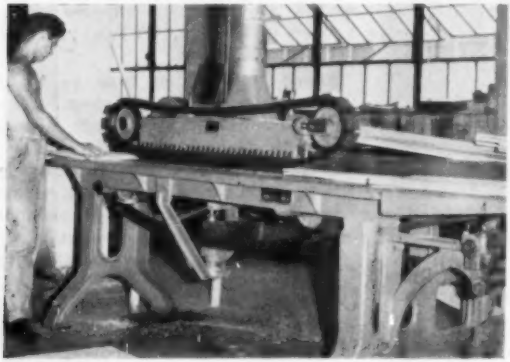
pending upon condition and appearance of dressed material.

Core stock is moved on dollies to the gluing operation, an almost continuous operation, where clamp arms of the glue machine hold plates of core stock pieces bonded with Armour's hide glue. When the hand cranks are tightened, the machine is rotated to the next position so that a new group of clamps is ready for another core. A cycle of the machine permits the glue to set for about an hour and one-half to two

After curing for a day or two, the plate of core stock goes to a planer which dresses the core to 7/8", 5/16", or 3/4" thickness, as required, before it is ready for veneering.

Cross banding of 1/20" Okoumi and face veneers of 1/28" hardwoods are cut to size on a clipper in the veneering department. Face veneers are then book-matched before joining and splicing.

Splicing is performed on a Diehl splicer with Rohm & Haas Uformite JS 508 glue. Electric heater elements, operating at 300 to 400 degrees, set this glue as veneers run through in a continuous operation.



**After matching, stacks of veneer strips are joined at this position for splicing later.**

**Compressed air brings together parts of the table assembly until bar clamps can be applied.**

Both crossbanding and face veneers are applied at once to the core stock with National Casein HF 69 glue, set for two to three minutes in a steam-heated hydraulic press. Steam is supplied at 18 lb psi.

The panel is trimmed before solid stock is fitted to the sides to make a table top. No other veneer work goes into production at Oxford, but veneered panels of all varieties are shipped to Kent.

Solid hardwood parts leave the mill at the point where core stock is glued up. Whenever possible, all solid parts are made of one piece, but if heavier dimensions call for glued-up stock, these are made with only two pieces.

Upstairs, four Moak band saws perform most of the further mill work on solid parts. All carved parts are first roughed out on the band saw before they go to one of the two 24-cutter Master carvers or the 16-cutter Salstrom. Some lathe work is done in the plant; but only pattern turnings are made there for production turnings subcontracted outside. Oxford stock is supplied to the subcontracting plant for such turnings.

The next step in finish milling is the trimming and boring for dowels. From

**Expert hands apply the special finishes, antique blending and glazing in the finishing department. The men here have had years of experience in this specialized work.**

there, the solid parts go to the cabinet assembly department in another building.

Final assembly begins with gluing veneer panels to sides and ends. These sub-assemblies are sent to the belt sander before legs and side rails are secured to the top. Hot glue is again used in this operation. A Bell two-way air press brings the framed assembly together until bar clamps can be applied to hold it for curing.

Assembled units leave the cabinet assembly department for a good cleaning, inspection and fine sanding by hand with garnet paper.

When bleaching is required, it is done in two applications of Spe-de-way Product Company's bleach. Another sanding with an 80-grit garnet paper follows the bleach.

Common practice in the past specified water stains, mixed in the finishing department from various pigments. But, Dombrowski informs us, the firm is now trying to convert over to alcohol stains because of a more satisfactory penetration and less raising of the wood grain. A light sanding after staining makes the surface ready for Greby's lacquer sealer.

Mahogany and walnut are finished natural, and in various shades of staining. Antique white and flat black finishes require no previous bleaching of the wood.

Blonde finishes and the classic name finishes featured in most of Oxford's catalog are applied after the natural wood is bleached. Grenoble is a reddish brown finish similar to brown mahogany. Basque, Kent and Piedmont are various shades of walnut. One of the tables we followed through the plant was an antique white, hand glazed over a pure white flat lacquer.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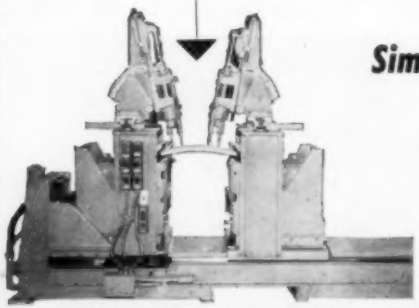

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Final finishing consists of two coats of clear lacquer, air dried for two to four hours and rubbed with Johnson's rubbing wax.

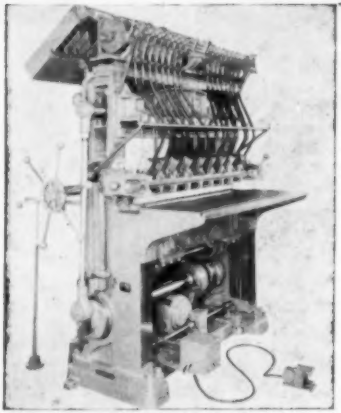
Finishing is done when an order is being made up for shipment. Approximately two to three days are allowed for the unfinished units to go through the final operation, crating and shipping.

That system of handling final work seems to offer a number of advantages for the Oxford system. No warehouse is required to protect finished furniture where dust may collect, or other damage may occur from handling. Oxford's catalog features customer finishes, tailored specifically to the satisfaction of an individual customer. No surplus inventory problems occur as they do in some plants where production schedules call for large lots of a given finish which may prove unpopular at any unexpected turn of the market.

Oxford appears to have a bright looking future for expanding the present facilities to produce more of their fine quality furniture—if Dombrowski can find employees to train in his technique.

## HYDRAULIC PRESS BROCHURE

R. D. Wood Company, Philadelphia, Pa., announces the recent publication of a new brochure on representative hydraulic presses and equipment manufactured by the Company for the woodworking and metalworking industries.

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# Evolution of LUMBER DRYING TECHNIQUES and DRY KILNS

**Part 10**

**By Paul H. Graham**

IN earlier type kilns gravity-type steam traps and hand-operated vents were used to eliminate air and water. Modern kiln design more frequently employs some form of thermostatic-type trap placed in the lowest part of each steam heating unit with automatic vents being provided which will stay open when coils are cool to permit free escape of air but close automatically when steam strikes them. When water of condensation is to be returned to the boiler by a pump or other similar device, it is common practice to make the connection between the traps and pump and/or receiving tank so that the water will flow freely away from the traps by gravity.

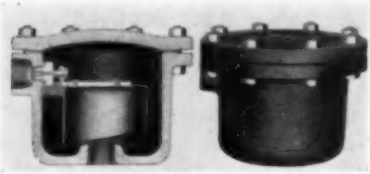
Some kiln elimination systems use a vacuum pump connected to the heating coils through a thermostatic trap to quickly remove air and water from the coils. Its efficiency in operation is primarily dependent upon efficient operation of the traps, as it cannot operate properly without them. This arrangement is used mainly for large kilns where its operation efficiency will justify its greater cost, particularly where low pressure systems are used. High and low pressure pumps are also used to return condensed water to the steam generation source.

In most applications separate coils are equipped with individual traps and many carry external blow-offs as well as air vents to permit more rapid heating of the kiln, especially where exhaust steam is being used. With the former practice of draining all coils into a single trap, water-logging and short-circuiting often resulted. In a typical installation all individual coils were trapped, to provide each section with an independent trap, and a thermostatic valve was installed in each return line so that there would be no water-condensation or air-binding in the pipe system. Each double-track unit was equipped with six 1" inverted bucket traps and large drain lines to remove all water from the coils immediately.

The bucket type traps are used with both low and high pressure steam to handle large volumes of water. They will exhaust either against a vacuum or atmosphere, with low pressure steam systems, and sometimes serve as a lifting trap to raise condensed water from lower to higher levels. The amount of elevation possible is governed by steam pressure in the trap. These traps are available in both inverted-bucket and open-bucket types.

Float traps provide a similar function in service except that their control is by means of a float instead of a bucket. Tilt traps are quite similar to float traps in general operation but

serve mainly as lifting traps using live steam to force out the water. Lift traps are essentially what their name implies and their use is confined mostly to raising condensation from a lower to a higher level after draining condensate from low-pressure, vacuum-pressure or varying-pressure apparatus. These traps



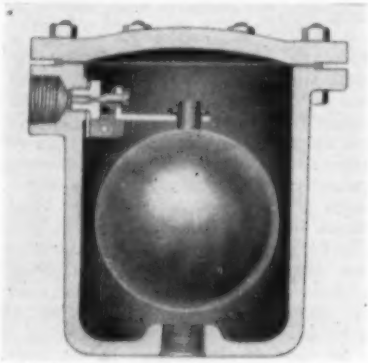
**Inverted open float steam traps—cross section and enclosed.**

discharge against pressure higher than that in the inlet line to the trap. When empty and connected directly to the live steam line, they use live steam to lift condensate to the boiler level thus relieving the discharge line of exposure to boiler pressures.

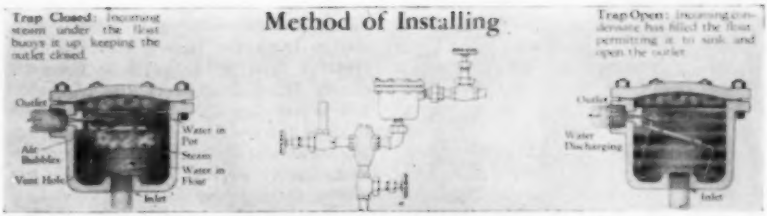
In the inverted-bucket type steam trap the bucket rests on the bottom of the trap, with attachment made to the discharge-valve arm, and the valve is open when steam is first introduced into the heating system. Condensing steam gradually fills the trap with water and discharges through the outlet until the system is clear. At this point steam flows into the inverted bucket and raises it against the discharge-valve arm until the valve is seated tight and the trap discharge outlet is closed. Air entrapped in the bucket is vented to accumulate in the top of the trap. Condensed water flowing into the trap gradually replaces steam in the bucket until the bucket again rests on the bottom of the trap to open the discharge valve and allow the water to be discharged. There is little danger of air-binding as the air in top of the trap always escapes through the discharge port before the water does.

The inverted open float trap is quite similar in design and operation and uses the weight of the float in the trap multiplied by the compound lever arms which attach it to the valve to open the valve against the effective pressure in the trap. (By effective pressure is meant the difference between the inlet pressure at the trap and the pressure in the discharge line from the trap, which is composed of actual pressure existing in the discharge line plus pressure due to the head of water which may exist in this line.) Its operation is based entirely on rise and fall of the float resting on the accumulated condensate. When filled with incoming steam, the float is buoyant and keeps the water outlet closed. But when incoming condensate fills the float, it sinks, thereby opening the outlet, permitting condensate to discharge.

In the open-bucket type steam trap the main operating unit is an enclosed metal bucket into which water of condensation flows until the weight of the water causes the bucket to sink. This opens a valve which allows the water to be discharged. When the bucket is



**Ball float automatic air vent valve.**




**Operation of inverted open float trap and method of installing.**

empty, it floats again and with this action closes the valve to keep steam from escaping. Some of these traps do not provide for the escape and automatic air traps or hand-operated pet cocks are fitted to them. Automatic air vents are also placed in drain headers and drain line to keep the drain line free. Sediment traps or separators are also installed at the inlet of each trap to prevent scale, sediment, and other foreign material from entering the trap to interfere with its operation. Drip pockets are also located at low points in steam lines or at places where the direction of flow is changed.

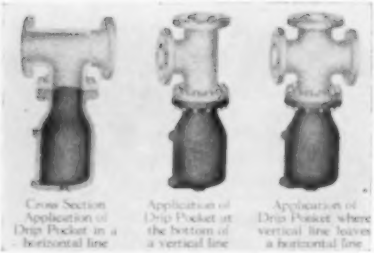
These steam traps operate intermittently, either with the discharge valve wide open to permit free passage of condensed water from the trap, or closed tight while condensation collects. This has the effect of pumping action upon water in pipe pockets or sags. They generally discharge against any pressure less than that at the trap inlet and are said to lift water about 2' per lb of pressure.

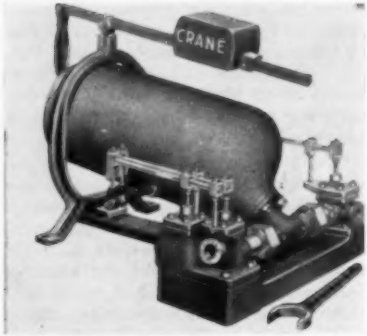
Lifting traps are primarily designed to handle condensation from low pressure systems and from apparatus which operates under vacuum or under varying pressures. Where it is necessary in handling condensation from low pressure apparatus to discharge it against a pressure higher than that in the inlet line to the trap, the lifting trap will perform this function better than any other device. Connected directly to the live steam line, it will not air-bind or steam-bind and temperature and/or pressure of incoming condensation has no effect on its operation. No heat loss, other than from radiation, is incurred as the steam used to operate it is automatically reclaimed in a properly piped system.

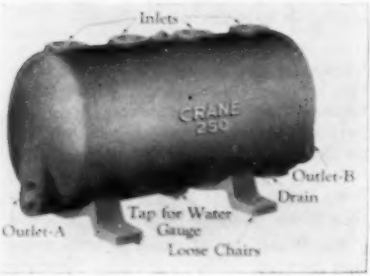
In a typical 3-valve lifting trap the steam, vent and discharge valves are all of the pilot operated type, in which the movement of the trap tank operates small pilot valves within the main valves. The main valves are actuated by pressure for quick opening and closing. The valves are on the outside, so the action of the trap is visible, and operation is entirely automatic.

In some dry kiln heating systems where the discharge from several traps are handled by a single lifting trap, condensation tank receivers are used to take care of irregular volumes of condensation and to provide a means for reclaiming the vented condensate from these traps. A typical piping arrangement is shown in the sketch below.

Nomenclature of various trap types has been somewhat confused by trade names for various steam traps. A so-called atmospheric trap is installed so that condensed water from the heating coil flows into it by gravity, entering at the inlet and passing through cored openings into the body of the trap. A diaphragm above the float diverts the water into the pot or body of the trap, where water gradually rising raises a float to close the discharging valve.


Cross Section Application of Drip Pocket in a horizontal line
Application of Drip Pocket at the bottom of a vertical line
Application of Drip Pocket where vertical line leaves a horizontal line




Courtesy Crane Co., Chicago.

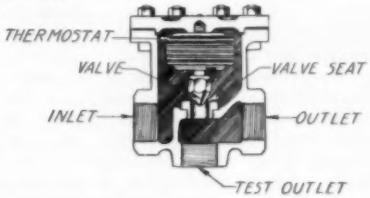
**Above: drip pocket installations in steam heating lines.**

**Center: three-valve lifting trap used to handle condensation from low pressure apparatus.**

**Lower: Condensation tank receiver provides storage capacity and means for reclaiming condensation when used with lifting trap.**

Since the main valve is closed, discharge from the trap is shut off and remains shut until the float becomes nearly filled from overflow of water into it and its weight becomes sufficient to open the discharge valve. Acting on the surface of the water, steam pressure immediately drives it up through the sleeve, through the discharge valve and on through the cored passage to the outlet.

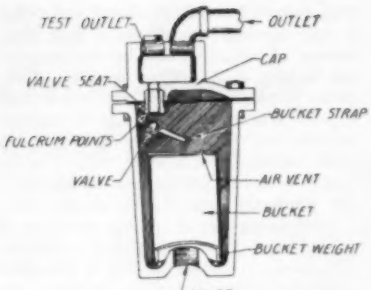
When the float has been nearly emptied, its weight is such that it is again raised by the water surrounding it to close the discharge valve, and the operation is repeated. The weight of the float is such that a permanent water seal always remains over the point of discharge into the sleeve to prevent escape of live steam when the discharge valve is open. Valve action is purposely made intermittent so that it must be either wide open or completely closed.




**Thermostatic steam trap.**

Forest Products Laboratory report No. R1664, "Steam Traps," provides a fine treatment of steam trap characteristics and operation and gives the following description of thermostatic traps:

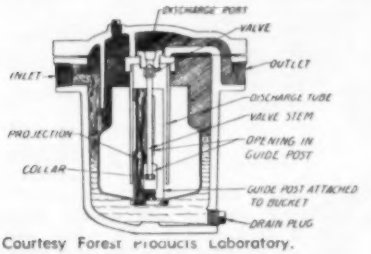
"The general operating principles of this type of trap are as follows. The bellows, which is filled with a volatile liquid, is attached to a discharge valve steam and valve. The motion of the bellows in response to temperature changes in the trap opens and closes this valve. When the heating system is first turned on, the coils are cold and




Courtesy Forest Products Laboratory.

**Inverted bucket steam trap.**

full of air and water and the trap is cold with the bellows contracted and the valve open. The steam entering the heating system displaces the air and tends to discharge it through the open trap. As the steam condenses, the water of condensation flows through the trap, which in turn is warmed by the water. As the trap temperature increases, the

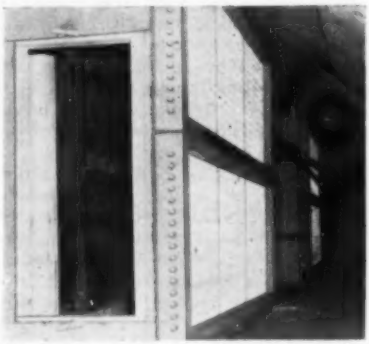



Courtesy Forest Products Laboratory.

**Open bucket steam trap.**

bellows expand, but not enough to close the discharge valve completely until all of the air and water have been omitted and steam enters the trap. The temperature of the steam causes the further expansion of the bellows so that the discharge valve completely closes, thereby preventing excessive loss of steam through the trap outlet. After the valve is closed, condensate again begins to accumulate back of the trap, cooling it. Eventually this cooling action will contract the bellows sufficiently to open the discharge valve. The cycle is then repeated. The thermostatic trap should be located outside of the kiln, both for its better maintenance and because the outer air will aid in cooling the condensate and thereby cause the trap to be more responsive."

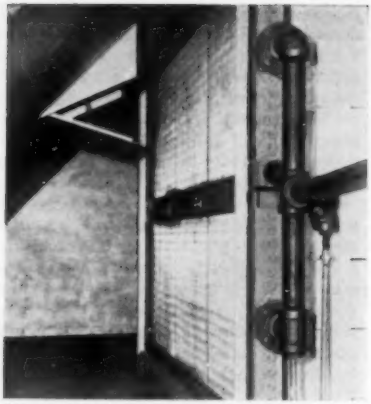
Regardless of the trapping system used, the steam traps should be suited in operating pressure to the heating system employed—exhaust, low pressure or high pressure steam. They should have adequate capacity for handling condensate for if condensate is not discharged as soon as it forms, it may be drawn back into the coils to cause trouble. The traps should be protected against freezing and wherever possible should be installed where condensation will flow to them by gravity. Most traps carry adjustment so the trap may be set for various steam temperatures, especially important in thermostatic steam trap operation.



Courtesy Crosby & Siegars, Inc., Portland, Me.

**Dual blast heating coil installation for external-blower kiln showing fan location behind coil to blow air through heater coil.**

Open back return bend or Y fittings are generally recommended for drainage connections to two or more lines



Courtesy Crosby & Siegars, Inc., Portland, Me.

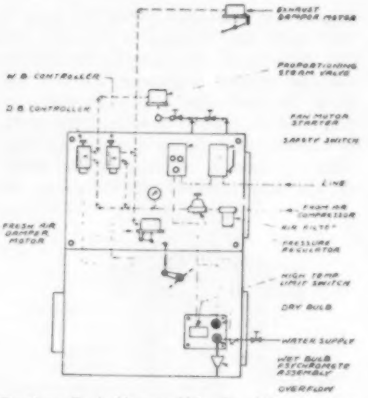
**Close-up of blast heating coil unit and pipe connections with damper open.**

as T's will seldom permit branch returns to operate properly. An air release valve or some other thermostatic trap is also considered necessary for efficient operation to permit the air to pass out or around the trap so that the system may be kept free of air. Good operating insurance may also be obtained by providing drainage headers with sediment traps and blow-off valves.

When his kiln steam trap action kicked up, a kiln operator devised a return system which not only permitted the trap to be removed without shutting of the supply but in itself acted as a syphon. Reasoning from his past experience that one set of coils usually discharges faster than the other, he calculated how he could make the faster-discharging side help the slower-discharging side. Referring to the sketch, if coil M discharges faster than coil N, then the surge of steam and water from M causes a vacuum in N by its fast movement past the fitting C.

By using three valves in the bypass system, where trouble occurs in the trap, valves 1 and 3 are closed and valve 2 was opened, to obtain a free discharge of water. Then by disconnecting unions A-A at the trap, no shutdown is required during removal and repair. When required to blow out the return line, all that is required is to close valves 1 and 3, open valve 2 wide, and permit full pressure to be blown to the discharge end of the return line.

Revamping this operating principle to permit piping the trap return to the return well, as shown in Fig. 2, he again used the principle of the syphon. As condensed water from kilns 1 and 2 enters on one side of fitting C, and




Courtesy D. J. Murray Mfg. Co., Wausau, Wis.

**Schematic view of grid lumber drying unit, a package kiln unit which combines all essential items. Heating equipment used finned pipe sections said to withstand steam pressures up to 250 p.s.i. and steam temperatures up to 450 degrees F.**

water from kilns 3 and 4 enters the other side, a partial vacuum is formed on one side or the other at all times. This aids in keeping the idle side free so that when a trap opens it has a free outlet clear to the hot well.

Although their use has not been too extensive, possibly due to their higher

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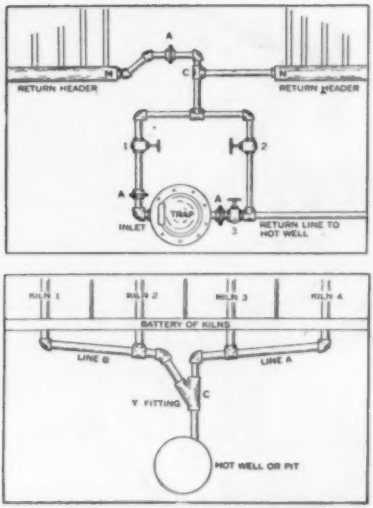


**Schematic layouts for return piping systems. Above: bypass for steam trap. Lower: return line from trap to return well.**

first cost, cast iron radiators similar to those used for house heating and hooked up into a similar heating system have been used in a few dry kilns whose design and operation required concentrated radiation. In at least one of these a change was made in the conventional radiator design by substituting heater coils of cast iron finned-type design.

Most kilns of the external blower type operate with unit heaters or heater cores. Basic heating apparatus usually consists of the heater, humidifier and fan. Some kiln designs are built about the use of package units which combine all essential items, including valves, traps, strainers, dampers and damper motors, controls, etc.

One of these package units is made with fin sections which will withstand steam pressures up to 250 lb. per square inch and steam temperatures up to 450 degrees F. The inner parts of the unit consist of a return air chamber into which reach the bulbs of the dry bulb and wet bulb controller and the high temperature switch, which cuts off the blower in case of control failure or fire. A fresh air supply damper is also built into this chamber from which a blower-type fan takes air out and forces it over the heating coils into the supply duct. The fan is belt-driven by a motor installed outside the unit. A steam injector distributes steam over the entire air volume and both heaters and steam injectors are fully piped, provided with control valves, strainers and proper traps. Controls include dry bulb and wet bulb controllers, steam proportioning valve, damper motors, and all electrical equipment so that no additional equipment is required.

Blast heating coil is made of copper tubing, aluminum fins and a steel frame. The coils carry steam and heat is conducted from the copper tubes to the aluminum fins to provide a considerable heating surface. Exponents claim the blast coil is easier to control, cheaper to pipe up, cheaper to buy, and gives a more uniform temperature the length of the kiln. Standard heater core equipment has two-row 24" fin tube heater cores. Each core is individually trapped to prevent water-logging. Although these cores generally operate on steam pressure of about 15 lb., the manufacturers claim they can be operated on steam pressures as high as 200 lbs.

Installed in a typical dry kiln designed for their use, steam to the heater cores is controlled by an air-operated valve in the main steam line. Fans are mounted in the kiln, blowing air first through the heater core, through the lumber and back through the fan again. Part of the air from the fan goes through the heater cores and part goes around the cores and mixes in a plenum chamber on the other side of the cores before going through the

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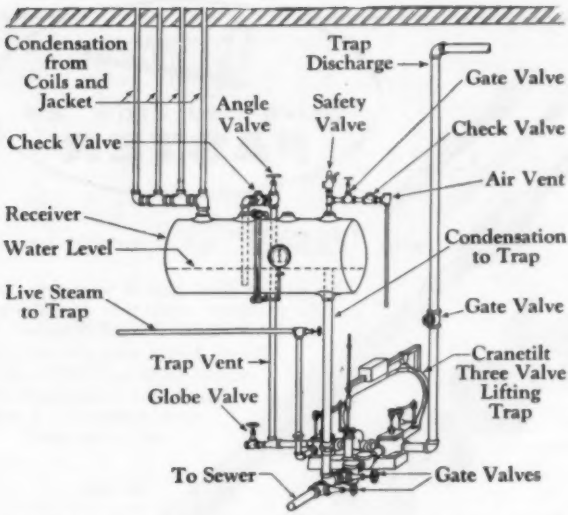


lumber. Controls are so arranged that when the control in the air stream demands more heat, the regulator opens an air valve and actuated by compressed air the main steam line control valve is opened to feed live steam to the heater cores. Provision has been made for the possibility of air failure so that the valves will close automatically by a spring return in the diaphragm opposite to the compressed air inlet.

A heavy duty heater used in another blower-kiln has headers made of heavy steel channels with welded tube sheets. Inner pipes are of ¾" standard steel pipe and helically wound fins, of soft carbon steel strip—9/32" wide—are attached to the pipe tapered from .035" thickness on the attached side. The finned pipes are given a protective coating of solder for a permanent bond and prevention of rust. Each pipe is also anchored to the header at only one end to permit free expansion and contraction independently so that no stresses will be transmitted to either the casing or connecting steam and return pipes.

In operation of these unit heaters and heater cores the heat supply is provided with valves so that portions of the heater or core can be used as needed for radiation. The basic design of these heaters permits easy elimination of air and water and their short pipes are generally free from difficulties resulting from uneven expansion and contraction. Where several unit heaters are used, the single units are usually equipped with separate hand-operated valves on both feed and return lines. This permits some of the units to be shut off when the kiln is being operated at low temperatures. On an external blower kiln in which all heaters are in constant operation, temperature within the kiln is regulated by controlling the amount of air that is permitted to pass through the heaters, usually by means of louvres on the low-pressure side.

As in steam pipe coil systems, heat transfer is essentially hot air and with proper control these unit heaters and heater cores provide an efficient dry kiln heating system.

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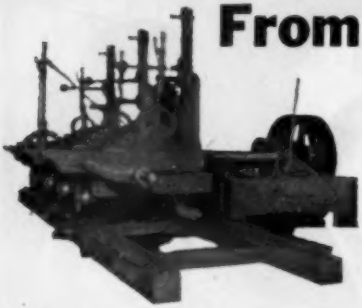

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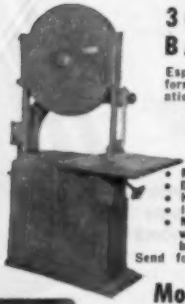

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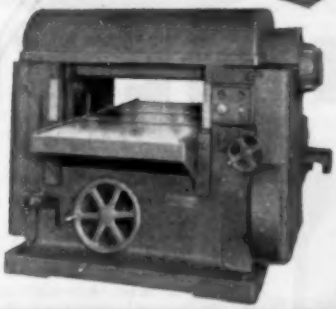

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# THREE-DIMENSIONAL *Planning*

By R. L. Bradley

**This story is not about a woodworking plant. It does, however, discuss the layout of a pattern shop within a large foundry. The purpose in presenting this story is to show our readers how this idea could be applied to their own plants. Studying the over-all plan, the flow of work, etc., before beginning actual operations will have the same advantages for the woodworker that it had for Fairbanks, Morse & Co.**

AUTOMOBILE parts, household appliances, industrial machinery and the thousands of other cast metal products start with a wood pattern. Such patterns may be small and simple or large and highly complex. As a result, pattern making for foundries requires the same careful workmanship, efficient shop layout and much the same equipment found in general woodworking plants.

The original wood pattern either may be used as a "working" pattern for the production of a small lot of castings, or as a "master" pattern from which a metalworking pattern is made. The mold in which the metal part is to be cast is formed by ramming plastic material, such as molding sand, firmly about the pattern.

The pattern which shapes the mold cavity is highly important both to the final cost of the casting and its efficiency. Naturally, then, foundry management pays close attention to the layout and equipment of the pattern shop.

So, when Fairbanks, Morse & Co. decided to build a new, integrated plant for the production of centrifugal pumps and engines at Kansas City, Kansas, every precaution was taken that the buildings, plant layout and equipment would insure lower costs, improved quality control and increased unit production.

As a comprehensive double-check on achieving these desired end results, Fairbanks, Morse & Co. had built a three-dimensional, ⅛" to 1', scale model of the manufacturing plant and foundry, including the pattern shop.

The model is complete in all details—floor plan, production machines, materials handling equipment and auxiliary and shop equipment. In addition to effecting substantial savings in construction of the buildings, the model also has demonstrated its value in the following ways:

1. The elements of production, such as floor area, machine space-occupancy and work flow, are reduced to tangible, three-dimensional factors.

2. Possible miscalculations, such as failure to allow for machine servicing, efficient operator movement or neces-

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Mr. Bradley is vice-president of Knight Models, Inc., Chicago, Ill.

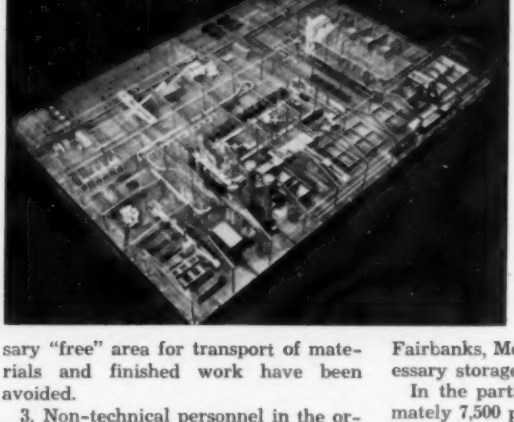

**Fig. A. Over-all plan of foundry. Pattern shop is seen at upper left-hand corner.**

sary "free" area for transport of materials and finished work have been avoided.

3. Non-technical personnel in the organization can see, understand and contribute to the layout.

4. Possible hazards or interferences become apparent before the design is frozen, thus avoiding costly delays and changes.

5. Requirements could be determined readily, with new ideas tested in advance at minimum cost in both money and time.

Benefits from the use of the three-dimensional scale can be seen clearly in terms of the specification for the Fairbanks, Morse pattern shop and necessary storage areas.

In the particular operation, approximately 7,500 patterns are involved. This number includes active, inactive and service patterns. Ten pattern makers are to be in the shop which covers an area of 3,020 sq. ft. of ground floor area. These men will work on both the production of original patterns and on pattern repair. There is an additional 25,820 sq. ft. of plant area devoted to pattern and lumber storage.

Woodworking equipment in the shop includes the following: Universal woodworker, tool grinder, cutoff saw, 24" planer, 24" jointer, tilting arbor saw, 30" band saw, 30" disc sander, spindle

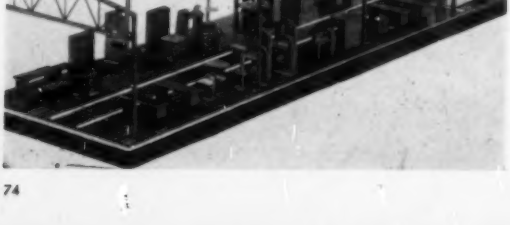

**Fig. B. Layout of pattern shop.**

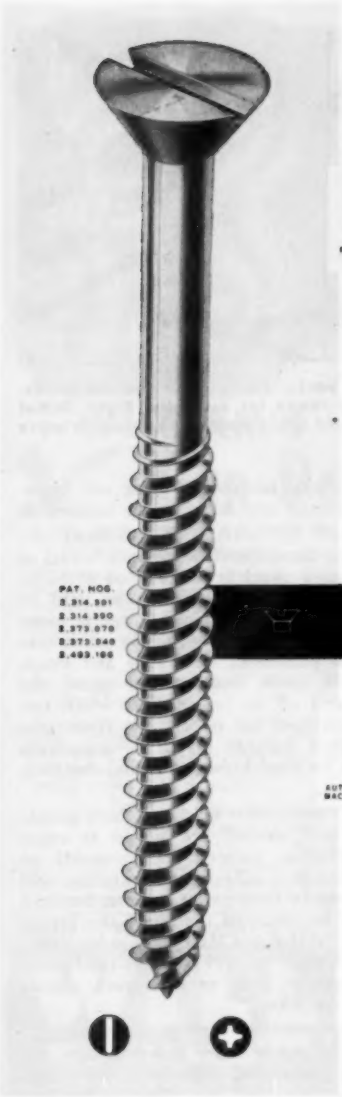

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**Fig. C. How models are made. Left: component parts—lucite sheet and rod, brads, clips and tacks. Center: parts cut to size and ready for assembly. Right: initial assembly and completed models. The dividers and other instruments show relative size.**

sander, 20" band saw, drill press, 16" lathe, work benches and checker's table.

Figure A shows the model of the complete foundry. The pattern shop, located in the upper left-hand corner is on the ground floor directly under the mezzanine. Pattern Shop and attendant storage areas have been positioned, not only for most efficient pattern production, but also to provide a minimum of travel and handling to each of the three molding areas. Figure B shows the pattern shop with machines and equipment in place. Relative size and detailing of the production equipment is shown in Figure C, which shows how the individual models are made.

Lumber and pattern storage areas have been planned with the exacting requirements for good patterns in mind. Pattern wood must have low shrinkage and warping tendencies. It also should have good nail-holding characteristics, light weight combined with moderate strength, resistance to wear, good machining properties and the ability to form strong glue joints.

About four-fifths of the woods used for patterns are native softwoods, with the major percentage being soft pines. Mahogany and some native hardwoods also are used to a lesser degree.

The three-dimensional scale model of this new plant is constructed of lucite which, while strong, is also light in weight. Floor grids are scored in exact ⅛" to 1' scale squares which make machine placement both easy and exact. Aisle areas and storage space are marked off by layout tape which can be stripped on or off the floor grid so that various layout arrangements may be tried before the final design is frozen.

All production machines, both standard and special, are scaled to exact dimensions, painted and mounted on double-face adhesive so that they will remain in their proper places, but still may be removed readily if the layout is to be changed later. This same treatment also is given non-production equipment such as conveyors, cranes and the like.

---

How much more grievous are the consequences of anger than the causes of it. **Marcus Aurelius**

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# KILN DRYING Forum

**Question**

*We have received a number of answers to this question varying with various sources of information. What factor limits the drying rate of lumber?*

**Answer**

During the period of drying during which free water is being evaporated from the surface of the lumber, the rate of evaporation would be the controling factor, but beyond this point drying rate of lumber is generally limited by the speed at which moisture diffuses to the surface of the lumber.

**Question**

*Although my kiln controller equipment has been tested and is properly calibrated, I have reason to believe that temperature in various parts of my kiln varies considerably, as evidenced by poor drying in certain areas. Is there any simple and inexpensive means available for measuring the kiln drying conditions?*

**Answer**

A solution to your current problem might be the use of thermocouples. Thermocouples probably provide one of the simplest and more inexpensive means for determining drying conditions throughout different parts of your kiln. They may be used portably or you can install them permanently in the kiln for continuous use.

**Question**

*We want to pre-dry our dimension stock prior to shipment to reduce our rail freight cost to the customer. This material is construction dimension which contains some knots. A trial lot was dried to a moisture content of 14% but our customer complained that considerable degrade was encountered in the form of checking and loosening of knots. What would you advise in this application?*

**Answer**

A more common practice in pre-drying dimension of this sort is to dry it down to about 22% to 25% moisture content. This will effect a substantial reduction in weight and the moisture will be removed more readily and economically than down to a moisture content of 14%. Knots should not be affected at 22% moisture content, but are apt to develop degrade below this point.

**Question**

*The damper motors of one of our kilns have a tendency to hold a continued "off" position. Investigation has shown there is no mechanical defect and I contend this indicates the kiln is calling for moisture and some thing is wrong with the operation of the kiln. My kiln operator does not agree. Am I right, or if I am wrong, what could cause this condition?*

**Answer**

It would seem that you are right in principle at least. A continued "off" position of the damper motor usually indicates a continued demand for moisture which usually requires investigation. Also, a continued "on" position, with the dampers open indicates the presence of abnormal kiln conditions and a possibility of too rapid drying, checking and/or casehardening. While you state the motors have been checked for mechanical defect, it is well to make sure that the damper motors work freely through their total operating stroke and that the linkage is arranged to permit this.

**Question**

*We have been warned against condi-*

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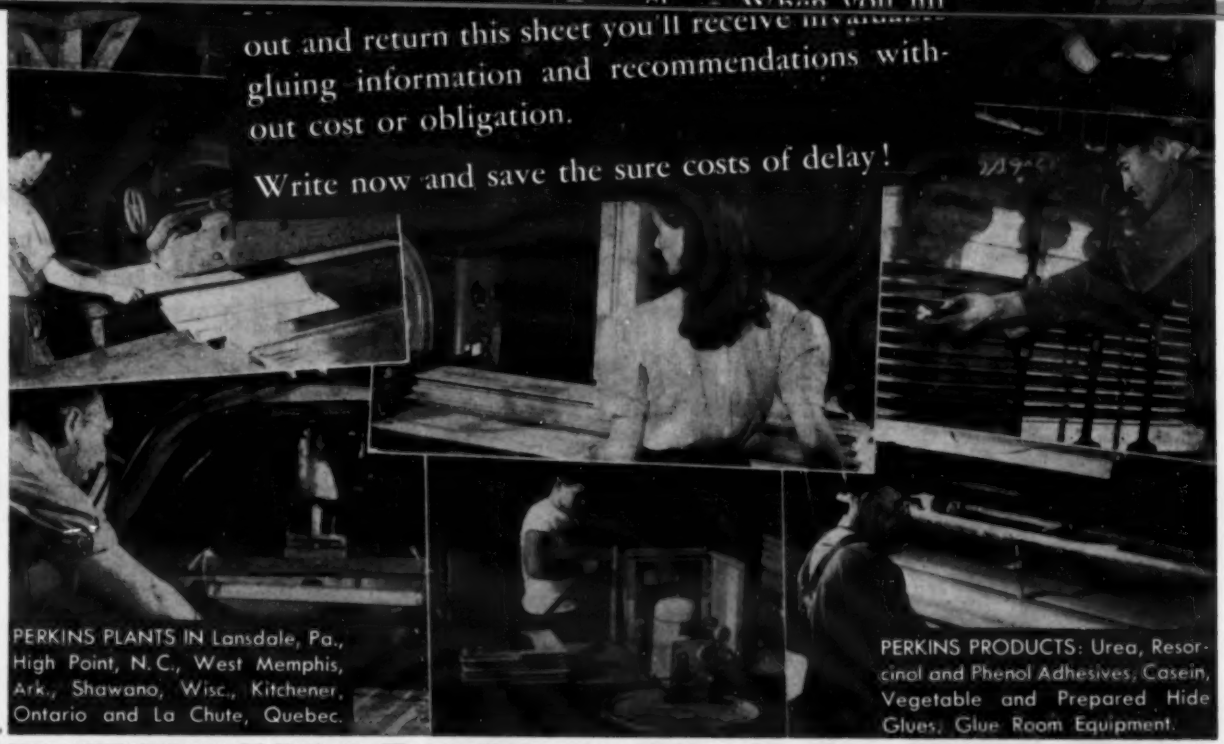

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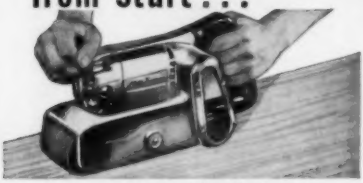

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WU-96


*tioning our flooring in kiln drying. How about this?*

**Answer**

It is common practice when kiln drying flooring to equalize, but not to condition flooring unless it is of the wide ranch-type flooring.

**Question**

*We have been told it would be impractical to put our kiln dampers outside on the roof because we are located in Canada. What difference does our geographical location make in our damper installations?*

**Answer**

The advice you have received relative to installing dampers inside the kiln rather than outside on the roof was probably predicated upon the cold weather common to your plant location in the winter season. Dampers installed outside have a tendency to freeze up and stick in the winter, as moisture comes down onto the linkage and the cold air drawn in freezes the moisture and so causes the dampers to stick and fail to function properly. Another important argument for installing the dampers inside is that capacity as a vent is considerably increased when the damper installed inside acts as a scoop.

**Question**

*We are having some trouble with brown stain on our pine lumber during kiln drying. What do you suggest as a remedy?*

**Answer**

Your trouble may be starting with incipient stain before the lumber is put into the kiln. Investigation of this trouble in your New England pine has indicated that hot logging is one of the best means to minimize this stain. The lumber should be cut as soon as possible and put right into the kiln. In kiln drying brown stain may be minimized by starting the kiln run with as low temperature and low bulb as it is possible to use without checking.

**Question**

*Due to heavy losses in degrade of lumber stored in open sheds after kiln drying prior to use in our plant, we are contemplating building a separate storage building. This lumber is used in the manufacture of furniture and we want to hold it to an 8% moisture content. What requirements must this building meet and what must be done to meet these requirements?*

**Answer**

The most essential requirements are building design and construction that will permit desired air conditions to be secured with efficient temperature and humidity control equipment. Provision should be made for letting in fresh air, controlled exhausting of inside air, an adequate heat supply and efficient humidification equipment. With proper building design and construction and proper control equipment, it should be possible to store lumber in this building and maintain the desired 8% moisture content indefinitely with a controlled temperature of 70 degrees F. and relative humidity of 42%, instrument dry bulb setting of 70 degrees and wet bulb setting of 56 degrees, or maintaining a similar temperature-relative humidity relationship in a proportional range suited to weather conditions.

**Question**

*We are planning a balasted paved yard for lift truck operations to hold about a million feet of lumber. Can you give us some idea of customary ballast used and thickness of the topping?*

The best information available on a project of this sort involves the construction used for a concentration yard handling more than a million feet of lumber with mechanized equipment. The general yard area was built up with 4 inches of rock to provide a solid base and this base was given a 2" to 2½" topping of asphalt. Six inches of rock was used for the main road area. The rock was well rolled and about 28 tons of black top mixture was used in the topping.

**Question**

*Are there any figures available on stacking lumber on kiln trucks using a stacking elevator and sticking guide?*

**Answer**

No accurate average figures seem available at this time but an operation of this kind, using sticking guide, stacking elevator and a two-man crew, regularly loads kiln trucks 52 courses high for loads averaging 3,000 to 3,600 board feet of lumber in an hour. One man does the stacking and the other lays the sticks and lumber is fed to this crew over a gravity roller conveyor.


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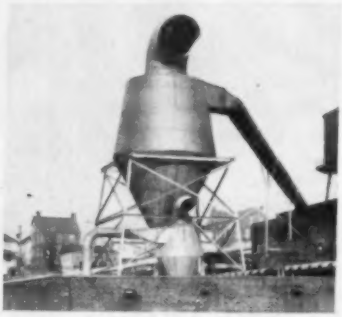

Large cyclone collector is part of Dixie Installation at Red Lion Furniture Co., Red Lion, Pa.

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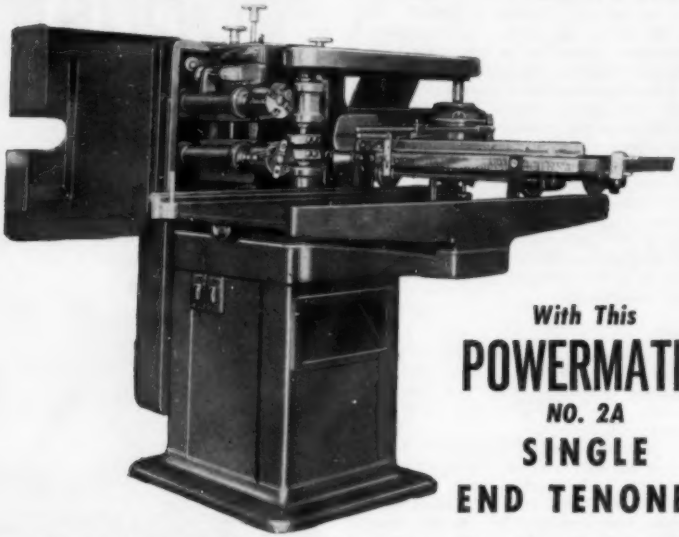

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# Little Staple Does A Big Job

A NEW JERSEY plant had been making a small wooden box, about the size of a cigar box, using brads. It was a slow process, so they called in a stapling engineer from the Fastener Corp., Chicago, Ill., to see if he could recommend a better way to assemble this box. He could, recommending a Duo-Fast air tacker, which drives a narrow crown, ½" long staple in place of the brads. Here is what the New Jersey manufacturer says.

"A few months ago, we bought a Duo-Fast air stapling machine. It has more than paid for itself in two or three working days. We had been putting in brads with a hammer, which took three or four times longer to do the job than with our air tacker. We now make 1,200 boxes in 1,200 minutes—a box a minute."

Therein lies the reason for the remarkable growth in the use of wire staples in production work during recent years. There's no great fastening miracle that can be accomplished with staples. The "miracle" comes with getting so much more work done, in less time, and using fewer workers.

Hand operated gun tackers, hammer tackers, and strike tackers have been speeding and simplifying tacking work for some time. Indeed, there are still many applications in woodworking and furniture plants where these manually-operated, automatic tackers fill the bill perfectly. The Duo-Fast hammer tacker, for example, requires very little effort to use, and will drive two to four staples per second in the hands of an average non-skilled workman. Thus, its wide use in furniture work.

The big step forward in the industrial staple industry, however, came with the development of pneumatic tackers. Fastener Corporation, working in conjunction with the automobile industry, pioneered the development of air-driven tackers. These are the machines which broke the production bottle-neck in upholstery and trim shops of the world's largest automotive body plants. Air tackers are now in extensive use for fastening headliners, windlace, door panels and seat backs into the modern automobile, resulting in remarkable production increases with fewer workers doing the work. And it is obvious that the staples do a fine holding job, otherwise the use of staples would never have been approved.

**TV cabinet production speeded with a tacker.**

The success of the Duo-Fast air tackers in the automobile industry opened the door to the introduction of this fast, effortless, efficient tacking method in furniture, woodworking, millwork, toy, and luggage plants, where these tacking tools are now in extensive use.

The adage of the staple industry is: Wherever hammer and tacks are used, the job can be done faster, easier, and

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**Tacker application for millwork.**

better with automatic tackers. Attaching various fabrics and materials to furniture frames and chair seats and backs, for years a job for the "tack spitter", is a "natural" for Duo-Fast tackers, so you find these tools working every day in the major furniture producing plants.

Woodworking and cabinet shops also find the automatic tacking method fitting into their production processes. For instance, various grills, fibre backs, and support blocks are Duo-Fast-ed into TV cabinets. In some cases, the use of staples is a temporary operation simply to hold a block or a wood strip securely in place while the glue sets. Here an automatic tacker—maybe a hand gun tacker, or an air tacker—solves the problem neatly. The staple can be countersunk so it doesn't have to be removed after the glue has hardened.

Along with the development of new staple driving equipment came the development of a wide range of different size, longer lengths, heavier wire, special points, special finishes, rosin-coatings and rust-proof staples. Today, Fastener Corporation, can furnish over a thousand types of staples anywhere from 5/32" long to 9/16" long, in various

**Luggage maker staples lining in traveling case.**

combinations of sizes, points, and materials.

The importance of the development of these various types of staples is shown in the furniture plants making case goods, such as dressers, cabinets, chests of drawers, etc. New tough, long, rosin-coated staples, driven by special super-power Duo-Fast air tackers solved the production problem of putting the backs on such case goods. A special guide attached to the bottom of the tacker positions the securely-driven staples accurately all around the case back. These manufacturers found other uses for the tools, too, such as stapling on mirror backs, drawer guides and dust bottoms.

Special guides and attachments furnished for Duo-Fast tackers have proved valuable to the sash and millwork plants where it is frequently important to spot the staples in exact positions. Some millwork shops are "letting air do their tacking work" for fastening moldings to doors and windows, to attach window guides and weatherstripping into sash, and to make window screens.


*Cut Longer*
*Without Regrinding*

• • •

*Cut Longer*
*Without Jointing*

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Designed for perfect balance and precision. Made from our own Special H. S. Steel, DETROIT KNIVES will increase your production and save you money.

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**DETROIT EDGE TOOL CO.**
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**Stapling case backs.**

The luggage maker, the toy manufacturer, and the boat builder likewise employ tackers and industrial staples to help them produce their products faster and at a lower cost. Like the other manufacturers, they have found that women and non-skilled men workers can use such automatic tacking equipment efficiently, that such tacking tools reduce the fatigue factor; that there is less danger of damaging the material—no hammer marks for example; and that the one-hand feature leaves the operator with the other hand free to hold the material in place, resulting in a neater job.

Indeed, the industrial staple industry has grown in stature to a place of real importance in the production world. Precision manufacturing of automatic tacking and stapling equipment results in the efficient quality needed for production work. A wide range of machines and staples have been designed to do many various jobs, so today a staple user can get exactly the type of automatic tacker and staple he needs for his given job. Finally the big industrial staple companies have trained men throughout the country to help manufacturers solve their fastening problems with staples. It all adds up to the little wire staple doing a great big job in American industry.

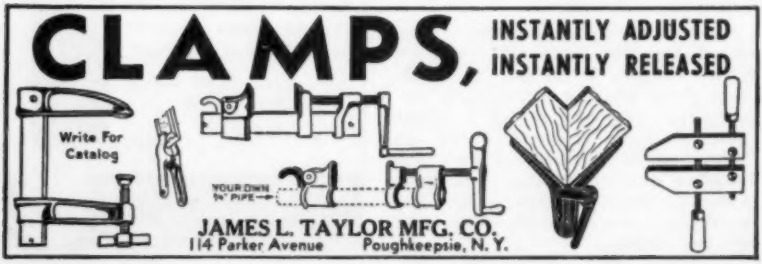
## SPRAY PAINTING SCHOOLS

The Binks Manufacturing Company's free school of spray painting began its fall schedule of courses September 13-17 at the company's Chicago plant.

These one-week courses are open to all those who are interested in learning modern and proper methods of spray application, and the correct care and maintenance of spray equipment.

The courses will be repeated: October 4-8; November 8-12; December 6-10.

The school is conducted in specially equipped classrooms. Attendance is limited to 25 so that personal attention can be given to individual problems. As much as possible, students with like backgrounds and problems are grouped together. First-hand experience in the construction and operation of spray equipment is supplemented with modern audio-visual training aids.

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NEW COLLAPSIBLE TYPE TRIP GAGE

Patented. Has such a large adjustment range, made possible by a new all-thread main ring, that most common stud projection heights can be secured with only one gage.

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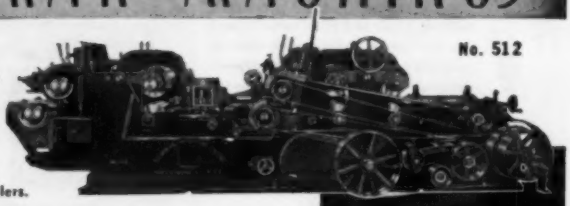
# NEWMAN MACHINES

**Newman**



**No. 512**

Capacity: 16" and 24" wide, 8" thick.
Speeds up to 325 feet per minute.
8" dia. cutting circle.
Six 12" dia. feed rolls.
Single and double profilers.

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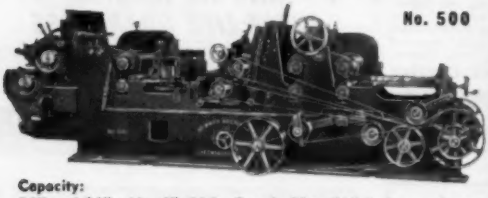

**No. 500**

Capacity:
14" and 24" wide, 6" thick. Speeds 40 to 200 feet per minute. 7" cutting circle. Six alloy steel feed rolls. High carbon special alloy steel cylinders. Single or double profilers.

The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25", and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

**HEAD GRINDER**

**No. 71**

**ORDER NOW FOR EARLY DELIVERY**

Ball and Roller Bearings

ALL NEWMAN cylinders or heads are DYNETRICALLY BALANCED insuring an accurate and superbly finished product.

## No. 55 AUTOMATIC PINEAPPLE FEED TABLE

The NEWMAN 55 feeds stock automatically to high speed planers and matchers up to 450 lineal feet per minute. Capacity: 30" wide, 8" thick. All adjustments and controls are centrally and conveniently located.

## No. 8-B PLANER, MATCHER AND MOLDER

The NEWMAN 8-B planes 22" wide and 8" thick, joints 4" thick and will match 14" wide. 6" diameter feed rolls. Speeds of 30, 50 and 75 feet per minute.

Unsurpassed for work in small and medium mills

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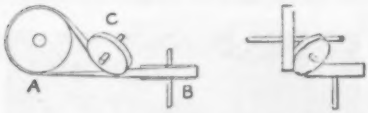
GREENSBORO, NORTH CAROLINA, U.S.A.

# Around THE SHOP

**A Short-Center, Reversible, Quarter-Turn Belt Drive.**

Do you know the rule that applies to quarter-turn as well as all other belt drives? This is it: "As the belt leaves any pulley, its center must lie in the plane of the pulley it approaches." Nevertheless, where pulleys are close together and it is quarter-turn drive difficulty is often encountered in keeping the belt on the pulleys.




This sketch shows how to take care of such a drive—by means of a guide pulley C placed between pulleys A and B. Place it in such a way that as the belt leaves either pulley A or B its mid-point lies in the plane of C. A study of the sketch at the right shows how this can be done—a single line being tangent to the three pulleys. The conditions of the above transmission rule are thereby fulfilled for either direction of travel of the belt. In other words this quarter-turn drive is "reversible."

**Magic Eye Sorting**

An electronic sorting system is being used to automatically sort cut stock from the cutoff saws. This system, engineered by the Buffalo Electronics Corp., Buffalo, N.Y., is operated by an electric eye device. Electronic sorting devices are placed along the conveyor from the cutoff saws at different off-bearing stations. These automatically operate an ejecting unit which pushes stock of pre-set length off onto a slide. From here it is conveyed to other machines or to storage.

**Production-Line Jointers**

By strategically placing several Delta, (Rockwell Mfg. Co., Pittsburgh 8, Pa.)

**Let's have your ideas on time-saving methods, cost control and increased production. We shall pay regular contributor rates for all copy accepted. Write the Editor.**

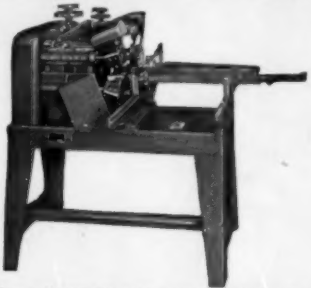
"I was a telephone lineman for a couple of years, but now I want inside work."

jointers along a conveyor system that carries furniture from one stage of manufacture to another, employees at Heywood-Wakefield Company, Gardner, Mass., are able to check proper fitting of all furniture attachments such as legs, hanging doors, drawers and others. Should a door, or other attachments, be a bit oversize, it is cut to proper fit on the jointer and then attached to the furniture frame.

### Two Machines Boost Production

Using two clippers, one above the other, is a common application with large deck systems and allows sizing of sheets and removal of defects while the veneer is moving forward. In another mill, veneer thicknesses are divided between two lathes to increase production. Setup time is also reduced. One lathe handles all veneer ranging in thickness between 1/16" and ¼"; the other cuts veneer 1/16" and thinner.

**HARRIS**
**DELUXE FLOOR MODEL TENONER**



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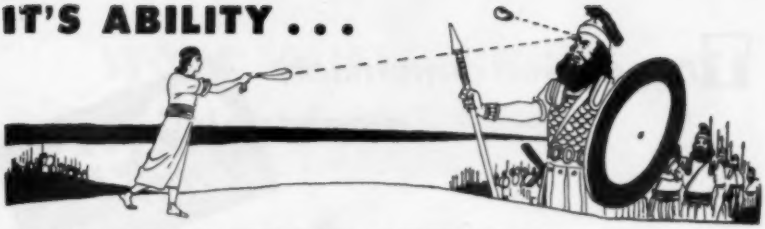
# IT'S ABILITY . . .



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If you want knockout performance in your moulding production, you want the **ability that produces results!** The ability to perform production records is due to the advanced design features you get when you purchase a Dependable Electro-Unit Drive Moulder: You get superior finish, quick changes in set-ups, multiple-knife work, variable speed drive up to 150 FPM, fewer knives running at higher spindle speeds, lower operating costs.

The Dependable Moulder's compact design is due to modern engineering principles together with dynamically-balanced, accurately-ground spindles, ball and roller bearings, and heavy cast iron base. All these mean less money and floor space tied up in non-working weight and bulk. Just as David won the match against Goliath by using the right principles, **not by weight**, you also have the tool available in the Dependable Moulder to go out and lick your production problems — with lower costs, higher output, better quality, lower maintenance.

**You, too, deserve to profit by the excellent performance of a Dependable Moulder!**

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The Nation's largest and most diversified producer of ***WOOD DIMENSION*** for furniture makers and other industries

# WOOD Vs. ALUMINUM

## Can You Keep A House Winter-Warm and Summer-Cool ?

**By John Reno**

THERE have been so many general statements made on the above subject that maybe, as one great American once said, we should look at the record.

This article will deal with the subject as it relates to the heating of surfaces such as house siding, windows, brooder roofs, storm sash, screens and ventilated awnings when exposed to the sun and the effect therefrom on the temperature inside the building.

It will also deal with winter heat loss.

Most of the data used in this article are contained in Building Materials and Structures Report BMS-64, entitled "Solar Heating of Various Surfaces," which is a publication of the National Bureau of Standards of the U. S. Department of Commerce—sort of a bible on the subject.

All authorities agree that a dark surface absorbs heat and becomes warm when exposed to the sun, so we will dismiss dark surfaces without further discussion.

Various kinds of surfaces were exposed to the sun by the Bureau of Standards and their temperatures determined.

BMS-64 states that a surface covered with glossy white paint was cooler than any other tried and that one covered with flat white paint was nearly as cool.

This report also states that a surface covered with aluminum foil was cooler in the sun than another covered with aluminum paint, but both were considerably warmer than the white painted surfaces.

And it is reasonable to believe, as is assumed in BMS, that the tendency of an exterior covering to impart heat to a house is increased as its temperature increases.

Finally, BMS-64 states that the best protection against heat from the sun would be a white painted surface— for instance, wood siding, shutters, awnings, farm buildings, etc.

The report concludes that oxidation of the aluminum and soiling of the painted surfaces would reduce their insulation effectiveness some.

Most aluminum siding is pre-coated or painted on the outside surface. This immediately changes the reflective property of the siding from the value of aluminum to that of whatever color of coating is used, and seldom is that color white—that best of all reflectors. And how long will this coating last? Premature and extravagant claims have been made. However, time only will tell. To date no known coating on any metal has lasted too long in the open. Even the superlative finishes on automobiles go bad when left exposed continuously to the weather.

The air space adjacent to the inner face of the aluminum is so narrow, with one edge of each piece of aluminum actually touching the sheathing, that probably this face has little if any reflective worth.

The above information has to do with radiant heat from the sun which is the category in which it was previously supposed that aluminum was better as a protection against summer sun.

When it comes to heat conduction, wood—painted or unpainted—is so far superior to aluminum as an insulator that it is positively amazing.

Figures in the Refrigerating Data Book of the American Society of Refrigerating Engineers show that, in a given length of time, aluminum of a given thickness and area will transmit almost two thousand times as much heat as will a piece of wood of the same dimension; and this means hot sun heat into the house or other building in the summer and expensive furnace heat out of the house in the winter.

Is it any wonder that those with windows of aluminum (or, for that matter, any metal) cannot sit within several feet of them on a cold winter day without feeling the full force of Jack Frost's attack.

Just touch the different materials with your fingers, even in Tampa, Florida, and you will understand why the area around the aluminum window is so uncomfortably cold in the winter. These cold surfaces create drafts and also we lose at least a small amount of our body heat to them by radiation, thus adding to our discomfort. This is even noticeable when sitting near that best of all metal windows—those in railroad diners and Pullman cars, which are built of metal because of structural reasons.

Unfortunately, this condition is made worse by infiltration around the edges of metal windows and storm sash due to the contraction of the metal because of the low temperature. Aluminum is worse than steel in this respect as it shrinks twice as much as steel. And to aggravate the condition still more, the aluminum and steel shrink in the winter when we would like them to swell to make a tight joint and then expand in summer, causing sticking, when we would prefer a little looseness. Investigation by the Pittsburgh Testing Laboratory disclosed that, when placed over the same window, a make of wood storm sash marketed in large quantities throughout the nation was more than five times as effective in preventing cold air infiltration as the best of the aluminum storm sash and those made of other metals. This well-known testing laboratory exercised its usual meticulous care to be impartial and objective in its investigation.

When it comes to keeping heat from the sun out in the summer and heat from the furnace in during the cold months, the above data merely confirm actual experience that wood is by far the best answer—and it looks better, too.

North Carolina's widely publicized vacation spot, Blowing Rock, is visited annually by thousands. It isn't far from where well known Lineberry Wood Cutting Tools are made.

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As for the expense of painting windows, siding, etc.—well, we paint wood only because we believe it gives wood a nicer appearance. Not many people will say that unpainted aluminum looks very nice several years after installation; and few people enjoy the condensation which is frequently experienced during the winter months on the interiors of metal windows.

When it comes to long life, siding and other products made of the heartwood of redwood, cedar and tidewater red cypress last indefinitely long, even in the face of any attack from the elements, fungus or insects, as do properly treated wood products of other species.

---

**After publication of the above article the manufacturers of metal windows and siding disputed some of the conclusions in the article. Mr. Reno answers their comments point by point, as follows, with figures from accepted authorities.**

**1. Comment:** Metal windows have made great inroads into the wood window market—Miami, Florida, is given as an example.

**Mr. Reno's Answer:** The use of aluminum windows above the basement in the U.S.A. dropped from 9% in 1940 to 5% in 150 and only 1% of the basement windows are of aluminum. This in spite of the almost irresistible force of millions of dollars of advertising, promotion, and publicity in behalf of aluminum building materials in the last 15 years. Advertising can sell initially but customer satisfaction governs in the end.

**These data are in the U.S. Government Housing & Home Finance Agency report, "The Material Use Survey," dated November, 1952.**

The Aluminum people have disputed these data and say that the government now admits that the 9% for 1940 may be in error. However, it is agreed that the 5% figure for 1950 is correct. Aluminum is losing ground where people have had experience with it. Its gains are in the new areas into which the aluminum interests pour millions of dollars in promotion.

**2. Comment:** It is the window glass, not the metal frame that transmits the heat and cold; and condensation caused by the frame is of secondary importance.

**Answer:** The fact is that window glass is 260 times better as an insulator than is aluminum. Heat or cold goes through aluminum of a given thickness 260 times as fast—and 260 times as much—as through window glass of the same thickness. That is why frost gathers on the aluminum so often instead of on the glass in spite of their different thicknesses. You will notice they admit there is condensation on the metal frame but call it "of secondary importance." There is no condensation on wood frames.

No, aluminum cannot compare to wood for window use.

**3. Comment:** The Pittsburgh Testing Laboratory annually tests aluminum window products of the members of the Aluminum Window Manufacturers Association to check air-infiltration against a standard.

**Answer:** How strict is the standard? It is this same Pittsburgh Testing Laboratory that proved by tests that the modern wood storm sash tested was more than five times as good in preventing infiltration of cold air as the best of the aluminum units. Laboratory Report No. 386855.

**4. Comment:** It is hinted that infiltration of cold air around windows is desirable because it permits water vapor to escape from the house.

**Answer:** This is an amazing statement. Here we modernize wood windows by weather-stripping them and the metal manufacturers try to equal the efficiency of the wood window by various types of designs and when unsuccessful they say, "Oh, well the cold air should be allowed to come in anyway because it reduces the humidity in the house.

Yes, we should reduce this humidity but is should be done scientifically.

**5. Comment:** Figures in the authoritative "Guide of The American Society of Heating and Ventilating Engineers" show that non-weather-stripped wood windows with their 1/32" crack have greater infiltration than the metal windows.

**Answer:** This is comparing a 1930 wood window with a 1953 metal one.

In my comparison I have used the modern aluminum window and the modern wood window for my examples.

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The modern wood window is weather-stripped and does not stick in winter or summer.

It does not decay because it is made of a naturally durable wood or of other woods that have been toxic treated to prevent decay.

Actually the Guide shows that modern weather-stripped metal windows have air leakage 1 1/3 times as much as weather-stripped wood windows in the double-hung type, while metal casement air leakage is 1½ to 2 times that of wood casements. In the non-weather-stripped variety the superiority of the wood window is even more pronounced.

These figures are for metals that are more stable dimensionally and that will stay tighter than aluminum. The aluminum manufacturers apparently have made no effort to have special tests made on aluminum windows, and the inference is they are content to "let sleeping dogs lie" and to use the more favorable figures of other metals, even though these show up poorly compared to wood. This policy also seems to apply to aluminum siding.

**6. Comment:** In commenting on total heat losses of aluminum and wood windows an advantage of only 4% was given to wood.

**Answer:** This figure is evidently just a statement of the aluminum people themselves as no authority was given for it. Also they said "neglecting infiltration of air." Of course, this infiltration of cold air is one of the disadvantages of aluminum storm sash and windows and must be considered when comparing aluminum with wood.

**7. Comment:** University of Michigan made tests which showed metal windows are no colder than wood windows.

**Answer:** Where is the report on these tests? Why is no report number or date


CASE HISTORY

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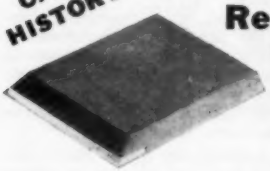

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given to permit procurement and examination of the report.

**8. Comment:** F.H.A. Bulletin UM-6 accords insulation value to aluminum siding with its two bright faces.

**Answer:** F.H.A. Bulletin UM-6 and F.H.A. Tech. Circular No. 7 show that walls identical, except for the siding, have greater insulation value when wood siding is used than they do with aluminum siding.

**9. Comment:** Aluminum siding is applied over other siding because of paint blistering on the latter due to moisture being driven through the wall from the inside.

**Answer:** Water blisters on paint should be remedied by correcting the conditions which cause the water to be present.

If aluminum siding is applied over other siding troubled with water blisters, the water will continue to be driven into the wall and when stopped by the aluminum siding will merely build up in quantity with bad effect on the entire wall. The least harmful result is an unpleasant, musty smell.

The best remedy is to remove the cause of the unwanted moisture and then no trouble from paint blistering will occur on any type of siding.

**10. Comment:** Wood had better be painted for reasons other than appearance if it is to be serviceable for any length of time.

**Answer:** Any well informed lumberman knows wood is painted for appearance only. Painting gives a different color to wood and it prevents the wood weathering. Weathering is the roughening and darkening of the surface of the wood. Unpainted wood houses are still sound and sturdy although more than 100 years old; or for that matter more than 200 and 300 years old. There are many of these fine old wood houses in this country. Salt air has no bad effect on wood. Actually wood tanks are used for the storage of salt water, acids and alkaline mixtures.

In closing I would like to comment that the truth is aluminum production has increased so greatly in the last few years for war purposes that the aluminum manufacturers are panicky in their efforts to find new peacetime uses to absorb this production, and have in some instances promoted it for purposes where other materials do a better job. Further investigations will be made for more articles on this subject.

For many purposes aluminum is good. For instance, we recommend aluminum nails for nailing house siding.

**Previously we have published part of this article by Mr. Reno. We are repeating it in part, by request, and are also including Mr. Reno's replies to some of the questions which were asked him.**

## PLASTIC-FACED PLYWOOD GOOD BASE FOR PAINT

A new grooved, warp-resistant, plastic-faced, 100 per cent waterproof fir plywood building panel engineered to provide the finest possible base for exterior paint coatings has been announced by Harbor Plywood Corporation of Aberdeen, Washington.

Produced under the name Harborite, the panel is designed for use as siding and interior paneling in all types of homes, schools, offices, stores, restaurants and other commercial structures. The company claims that it is the finest quality plywood siding panel on the market.

The panel has an earthy reddish-brown color that can be used for interiors without finishing although its primary purpose is to hold paint without peeling, blistering or checking. The face is marked with vertical grooves spaced 4 to 12 inches apart. Random widths are available. Panels come in standard 4 x 8-foot sizes.

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# *New Literature*

**DIEHL RIP-SAW**

Publication of a bulletin with complete information and description of the new model No. 99 multi-rip saw has been announced by the G. M. Diehl Machine Works, Inc., of Wabash, Ind. This bulletin tells how the Diehl No. 99 multi-rip saw offers the woodworking industry gang-rip mass production—with single-rip precision.

Diehl engineers designed an entirely new concept in multi-rip saw construction. The result is the No. 99 which features the first unitized design, with arbor, arbor motor, and throat plate mounted on the frame. This eliminates table and arbor adjustments and provides extreme rigidity necessary for ac-

# *America's Fastest* SANDER

## of Irregular Shapes

# The New PEARSON Model "A"

**Will not disfigure details of mouldings . . .**

60% to 80% saving on sandcloth in sanding irregular shapes has been reported by many plants using a PEARSON MODEL A SANDER. Other cost saving features include sanding one or more stepdowns at same time, saving several costly operations; sanding of inside radii of circles and very flat tapered moulding. It is one of the fastest and most efficient sanders for irregular shapes on the market today! With the Pearson Belt attachment this model can be converted to an all-purpose sander at a small additional cost.

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Standard equipment includes 7 metal heads and 14 cushions made of the finest grade rubber. Length of cushions range from ¾ to 4 inches: outside diameters, 3¼ to 7 inches.

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HUNDREDS OF SATISFIED USERS of our Sanding Machines are an indication of the outstanding quality of our equipment. You too can save time and money by turning to PEARSON!

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curate ripping. There are 8 feed speeds between 50 and 180 f.p.m., and stock up to 3¼" thick can feed through the Diehl No. 99. A total of eight powered feed rolls gives a smooth positive feed of stock. A double set of kick-back guards protects the operator. Engineered for easier operation, reduced setup time, and consistent accuracy with greater production—the Diehl No. 99 answers a definite need in the woodworking industry.

### WOOD WINDOWS BROCHURE

The Architectural Woodwork Institute, 332 South Michigan Avenue, Chicago, Ill., has published its third in a series of brochures covering numerous phases of architectural woodwork.

Brochure No. 3, "Wood Frames and Windows," is an eight-page technical publication being sent to architects of the Institute members' choice. The brochure shows outstanding installa-

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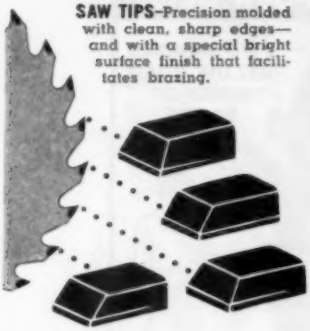

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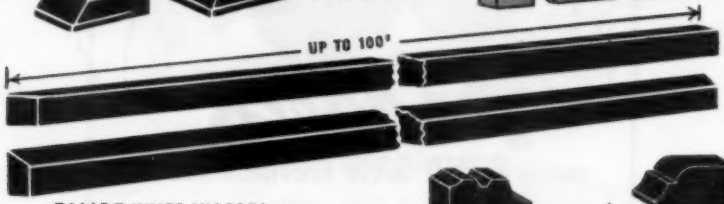


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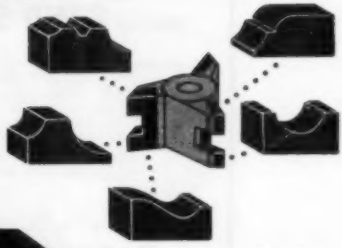

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Preformed to accurate tolerance with minimum stock—and to any form or shape desired.

tions of various types of wood windows currently being used in hospitals and schools and demonstrates how wood windows can be adapted to a variety of operating mechanisms.

Information valuable to specifiers of wood windows regarding the correct grades to be used for softwoods and hardwoods is also included. Over 9,000 architects throughout the United States and Canada will receive this Brochure.

## SANDING BOOKLET

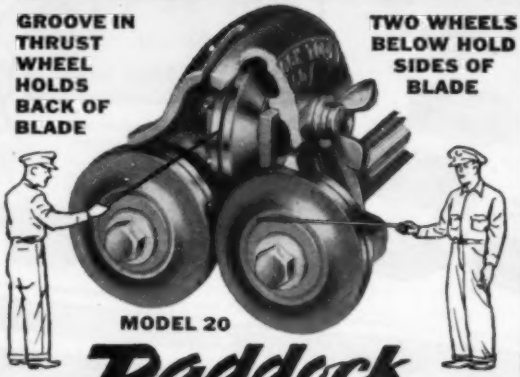
"Let's Sand To Get Results not to Make Sawdust" is the title of a booklet published by Syncro Corporation, Oxford, Michigan, and is free upon request. The booklet describes proper sanding techniques, abrasives to be used, wood finishing, etc. It also shows many other ways to use sanders on all materials.

The data and techniques contained in this booklet have been compiled by

Sturdy, Strong, Band-Saw Guide

GROOVE IN THRUST WHEEL HOLDS BACK OF BLADE

TWO WHEELS BELOW HOLD SIDES OF BLADE



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### WAPAKONETA CATALOG

A new catalog that illustrates the complete line of machine knives, shear blades and cutters for the woodworking and steel industries has been produced by the Wapakoneta Machine Co., Wapakoneta, Ohio.

The catalog describes all types of machine knives and shear blades, straight, circular and irregular. Photographs of all types of blades produced by the 60-year-old Ohio company are shown.

### NATIONAL'S KWIK-KLAMP 3048

National Adhesives Kwik-Klamp 3048 offers high-volume, plastic surfaced furniture manufacturers, a means of eliminating delays in their gluing-off lamination operations.

This resin adhesive is said to be very

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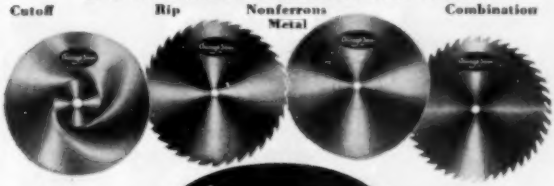


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fast-setting, ready-for-use, producing a workable bond of plastic and back up sheet to core in gluing cycles as short as 15 minutes. This should be of particular interest to manufacturers of dinette table tops, case goods, institutional furniture, etc.

According to National Kwik-Klamp 3048 eliminates the need for specialized equipment, baling and glue mixing. It also is said to streamline and simplify production.

National has issued a leaflet, entitled "Recent Advances in Plastic Laminations", which describes and illustrates the advantages of the Kwik-Klamp 3048 process. Copies of the leaflet may be obtained from National Adhesives, 270 Madison Avenue, New York 16, N.Y.

## RADIALLOY-TIPPED SAWS

An informative, 4-page brochure has recently been made available by Radial

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Cutter Manufacturing Corp., of 831 Bond Street, Elizabeth 4, New Jersey. It describes and illustrates their new, radialloy-tipped, super-finished circular saw blades with perfected body and tip for cutting woods, plastics, composition materials, non-ferrous metals including bronze and aluminum.

The booklet tells how these high-quality saws cut production costs and boost profits on precision and long-run jobs; describes their long life, faster, smoother operation and proper selection of tips for specific applications. The salient features of design and construction that assure maximum, dependable service are listed. These include a heat-treated, precision-ground steel blade which avoids vibrations at any speed, plus extremely tough, durable and wear-resistant carbide tips. Each radialloy tip has **full steel backing** for maximum support as well as a special safety lock designed to prevent tip from flying off. These factors, plus the precision diamond grinding and the special super-

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finish given to the cutting tip edge, produce a sharp, long-life saw which cuts cleaner, faster and requires a minimum of re-sharpenings. The detail of construction features is illustrated showing the full steel backing of tip, cushion braze far stress relief and the locking angle of tip into blade for safety.

### ADAMAS CARBIDE ADDS WOODWORKING SAW TIPS

Adamas Carbide Corporation, Kenilworth, New Jersey, manufacturers of tungsten carbide tools, tool tips, dies and wear parts, has announced the availability of their new line of woodworking saw tips.

These saw tips are available from stock in a comprehensive range of sizes and are made in two standard grades: Adamas Grade A—For fine cutting in hardwoods, laminated material, plastics, hard rubber and other abrasive materials; and Adamas Grade B—For shock resistant applications, cut-off and power feed ripsaws.

# *New...* 24" SINGLE DRUM ENDLESS BED SANDER

This non-oscillating 24" drum produces smoothest kind of sanding on hard or soft wood. Drum is of metal construction, 24" long, 14" diameter, felt covered, with spring action lock keeping sandpaper snug and tight. Non-oscillation of drum leaves no cross streaks. Has variable rate of feed, 15 to 30 feet per minute. Can be stopped and started while machine is in operation. Feed works fitted with grease fittings for lubrication. Endless bed fitted with rubber inserts. Frame is of welded steel construction, cabinet type, rigid, with doors on both sides. Has capacity for material up to 6" in thickness. Standard machine has capacity for stock as short as 15". On special order — machine can be fitted with two extra Idler rolls to handle stock as short as 8". Dust hood easily removed for changing sandpaper or for sanding curved work on top of drum. Drum bearings have pregreased sealed races. Idler rollers mounted on sealed tight ball bearings. Machine driven with 3 HP motor 220 Volt, 3 Phase, or 110/220 Volt, Single Phase double Vee belt drive, with starter. Weight 650 lbs. Floor space 46"x40".

**Complete with motor platform, grooved pulleys, endless belts, wiring and starter.**

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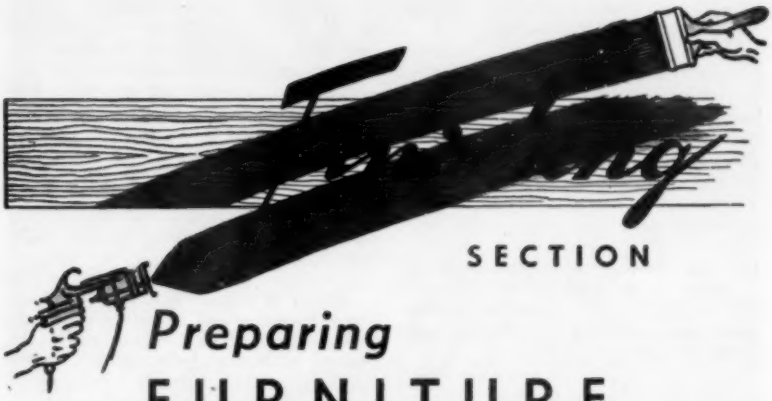

SECTION

# Preparing FURNITURE For Finishing

**By H. H. Connelly**

WHAT is good sanding? How can I tell when a piece of furniture is sanded correctly for quality finishing?

The answers to these and many more pertinent questions deserve a careful analysis of the best sanding practices in the furniture trade today.

Sanding, reduced to its simplest definition, serves only one major function in the cabinet room of the furniture manufacturer—to remove all planer, shaper and moulder marks left by uneven knife cutting in the operations of machining or to reduce the rough surface of a veneered panel to a receptive level plane for quality finishing. We could define sanding as a final cutting operation in the process of manufacturing wood products; the abrasive grains, in this instance, acting upon the wood surface like so many thousands of precision ground knives.

The abrasives, because of their size, can leave a finish rough or smooth—the screened size of grits being the determining factor. On the other hand, however, we are not only concerned with the degree of sanding quality, but we must consider the balance between cost and quality required. For tied directly to the degree of fineness or coarseness is the cost of our operations—on one end of the seesaw the grit size, on the other costs. As the grit grows finer the costs rise; conversely the coarser the grit the cheaper the sanding operation.

Despite the many trade names for abrasives there are only five that the furniture worker need remember. These are garnet, flint, emery, aluminum oxide and silicon carbide. Of the five only the first three are natural abrasive minerals, mined and refined for commercial use. The remaining two are

artificially made by combining elements under controlled conditions of high temperature in an electric furnace.

Garnet is, by far, the most important of the natural abrasives for sanding in the furniture trade. The best garnet for abrasive use, comes from red almandite obtained in large crystals from the Adirondack mountains of New York state. It can be easily identified by its reddish color.

Garnet is one of the softest of the so called hard abrasives, with a hardness of 6 to 7.5 compared, on the moh scale, with diamonds, the hardest substance known.

This fact should be kept in mind when selecting an abrasive for a job. It lends itself to the greatest efficiency (1) when the heaviest pressures are applied, (2) when the sanding job tends to load the abrasive belt prematurely and burns the work being sanded excessively.

Here is another important point to remember. Since garnet is the cheapest grit, it is highly desirable on jobs that use paper by virtue of filling rather than wearing, as is the case of sanding pine and other fatty woods. It performs very satisfactorily on the drum sander, and edge sanding operations where a small area with heavy pressure is applied. Garnet is highly satisfactory on turning sanders where shredded paper or cloth is used for the backing. It is economical for brush back sanding moldings, as well as drawer dovetail sanding. For finishing paper, that becomes useless after a few strokes of the sandblock by virtue of filling the paper with varnish or shellac, the cheaper garnet is more economical. The grains of the higher priced artificial abrasives will fill just as often as the cheaper garnet and become a part of the waste sandpaper cluttering the finishing room.

Flint holds little interest in today's scheme of sandpaper production, having neither the strength nor the stamina necessary for industrial use. Since historic days of the joiner, flint has occupied an insignificant place of importance.

Flint is a quartz, off-white in color, and commonly found in many sections of our country. It is still used, however, as an abrasive for cheap sandpaper, now largely sold over the counter by paint and hardware stores.

Emery is the oldest and possibly the best known of all abrasives. The best variety comes from Camp Emeri, on the island of Naxos, from which it takes its name. Small amounts are produced in New York and Massachusetts.

It is dull black in color and unless properly labeled can easily pass for the harder more finely graded synthetic abrasives. Emery consists of crystals of natural aluminum oxide embedded in a matrix of non-abrasive materials such as iron oxide. Some varieties of emery show a fair proportion of cutting agent, but the grains themselves, irrespective of size, are composite and break down easily under impact. Figure 1 shows the similarity of synthetic aluminum oxide crystals to emery.

Aluminum oxide, the softer of the two synthetic abrasives mentioned, though harder than the natural abrasives, is characteristically brown in color. It is made by fusing bauxite with intense heat in an arc-type electric furnace. When pure, it is a white powder or it forms in colorless crystals. For abrasive purposes (generally preferred with some impurities) it is black in color and is dense in structure and resistant to maximum grinding pressure. The fast cutting action is due to the sharp minute crystals, a distinguishing feature of aluminum oxide from that of silicon carbide.

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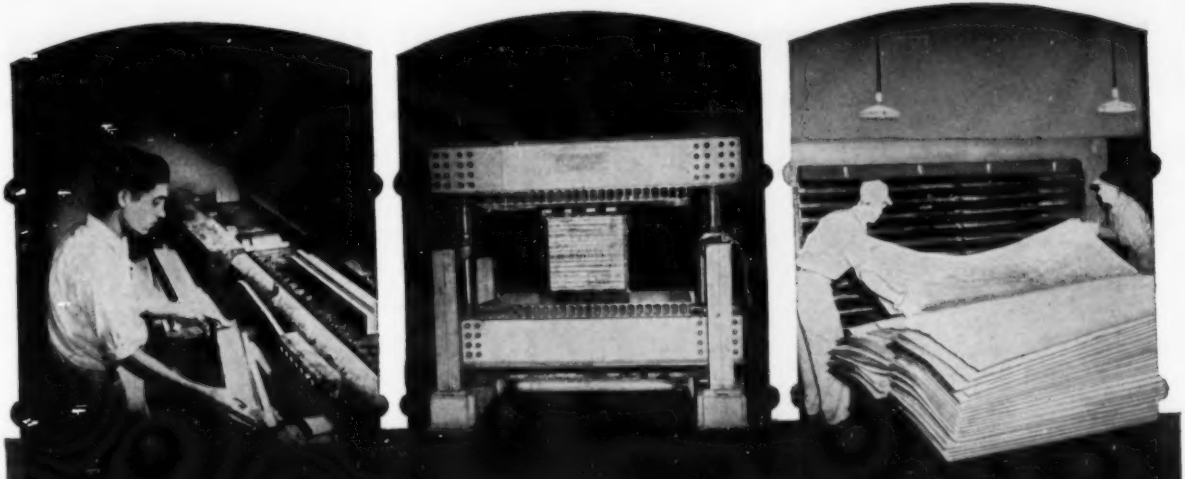

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POLYVINYL . . . CASEIN . . . UREA RESIN . . . PHENOL RESIN . . . RESORCIN RESIN . . . EPOXY RESIN . . . ADHESIVES

Silicon carbide is a blueish-black crystalline artificial mineral made in a similar process to that described for manufacturing aluminum oxide, except sand is fused with coke and sawdust, using salt as a flux. Its hardness approaches that of diamonds, a deciding factor in its favor for cutting hard surfaces. Unlike aluminum oxide, the crystals are large and it is crushed to make the smaller grains required for abrasive purposes.

Both silicon carbide and aluminum oxide abrasives are ideal when a high speed and reasonable pressure is used. They are both recommended for stroke sanding and polishing when high grade, quality work is desired. The synthetic abrasives are used very satisfactorily on the drum sander for clean, fast cutting operations in many plants. If phenolic glue is used as a bonding agent, the paper can be cleaned frequently by water. One concern dampens the rolls at quitting time each day and in the morning the wood fibers imbedded in the grits are swelled out of position and are easily removed, leaving the paper clean and sharp for another days work.

Disregarding the kinds of backing and considering the type of abrasive only, a number of rule-of-thumb generalities can be formulated that will assist the production man in selecting the most suitable abrasive for sanding.

(1) Select garnet when heavy filling action is the order of the day.

(2) Select garnet for edge sanding where burning is most prevalent.

(3) Select garnet for brush back sander jobs that wear out by breathing rather than dulling.

(4) Select aluminum oxide for fast operations such as stroke sanding and polishing machines. Aluminum oxide cuts clean and fast and has longer


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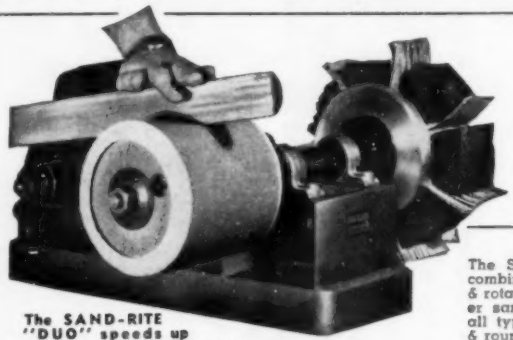

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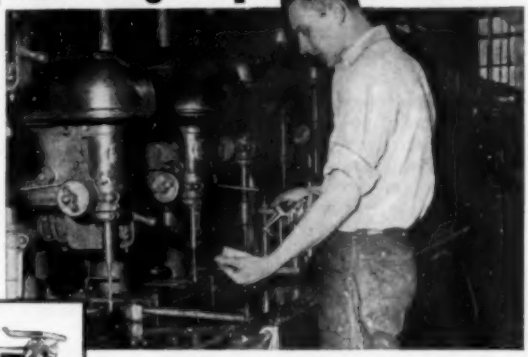

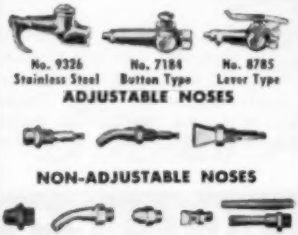


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mileage. When garnet will break down rapidly under such operations causing production delay because of frequent belt changes, the aluminum oxide and silicon carbide will still be cutting clean and fast.

**Relationship of Sanding To Finishing**

Complaints of poor filling and finishing are often the result of inadequate sanding of cabinet work in the white.

Recently a service engineer of a finishing supplier was called in to correct what the user termed poor filler. A close examination of the stock revealed a number of foibles that could have caused the complaint. Chief among these was the poor preparation which had been given the walnut panels prior to the first finishing operations—staining and washcoating. The panels had been given only one sanding and this was with a rather coarse grit for finishing. A new sanding schedule consisting of a rough sanding with a 2/0 abrasive followed with a polish sanding with 4/0 sandpaper was started and the same finishing operations continued. That the poor sanding was materially effecting the final finish and could not be corrected by the filler regardless of care in application was evident. The former graininess and rough surface texture disappeared with the starting of the polish sanding.

Sanding was the answer to this man's problem; but regardless of the care in sanding and polishing furniture panels in the white, some woods behave badly when filled. This is especially true of woods which are rather coarse grained and have a tendency to raise when filled.

Walnut, for example, is subject to pulling. The elongated splinters (formed when the wood is sanded through the cells) catch under the loose fibrous tow, jute, or wiping rags and are pulled from the surface. This leaves an unfilled


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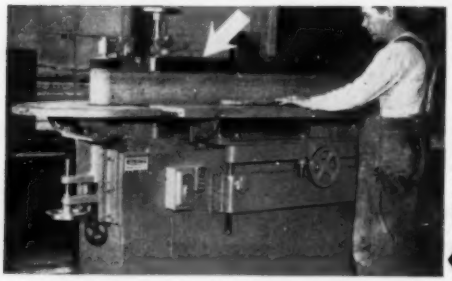

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portion that shows as rough textured when polished.

Filling will not correct these defects unless treated as a special, localized condition and each torn grain individually corrected.

Rather the condition should be corrected before filling. One step that can be taken that will minimize this problem is glue size. Another is washcoat. Another, that has helped in numerous plants, is by allowing more penetration of glue into the faces during the veneering process.

The percentage of walnut shell flour, which prevents bleed through, can be reduced so that a higher percentage of liquid glue seeps into the pores of the face veneer and consequently forms a bonding agent within the cells. Such a condition holds the fibers intact when sanding and keeps the thin, toothpick-like fibers from raising when filling.

The second possible preventative step, glue sizing, is effective provided the proper sequence of operations are followed and the correct sizing mixture applied.

A solution made with 10% of liquid glue to 90% of warm water is a proven glue size solution.

It can be applied after the rough sanding operation, allowed to dry, then let the polish sanding operation do the job of hand sanding. It is wise not to remove too much wood at the polishing or the penetrated glue size will be entirely removed. Consequently, you will be undoing all the labor of sizing.

The second recommended method of applying glue size is as follows: The furniture panels are rough sanded, polish sanded, then glue sized. A drying period permitted, followed with a scuff hand-sanding, using either 5/0 or 7/0 finishing sandpaper. Sanding should always be with the grain.


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The third mentioned method of pretreating furniture panels to provide an adequate base for good filling was wash coating. Wash coating was tried in a furniture plant manufacturing walnut tables in an effort to eliminate torn grain. It was quite effective and provided results that were superior to former efforts to prevent the holes by glue sizing.

This may not be the case in your experience but where glue sizing has not proven effective in the elimination of torn grain, the wash coating may. A wash coat can be made in two ways: (1) shellac thinned with alcohol or (2) lacquer thinned with lacquer thinner.

The use of shellac is preferred over the second formula. The alcohol, contained in the first formula, will absorb any water which might be in the wood or on the surface from the surrounding air, and will evaporate carrying the moisture along as a passenger. The lacquer sealer has the reverse effect. It is not soluble in water neither is water soluble in lacquer sealer.

A shellac wash coat, however, takes longer to dry and is not recommended on a shellac that has only a short drying period between wash coating and filling. Shellac will ball up and fill the sandpaper, if not thoroughly dry, and produce a poorly prepared panel for filling.


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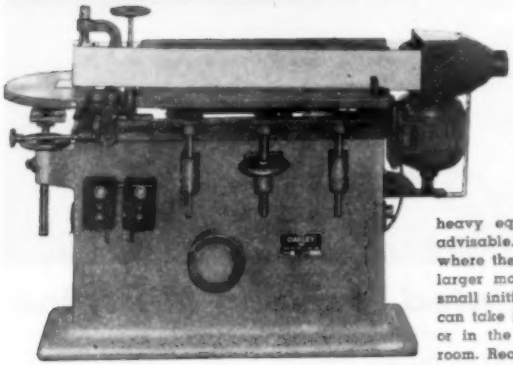

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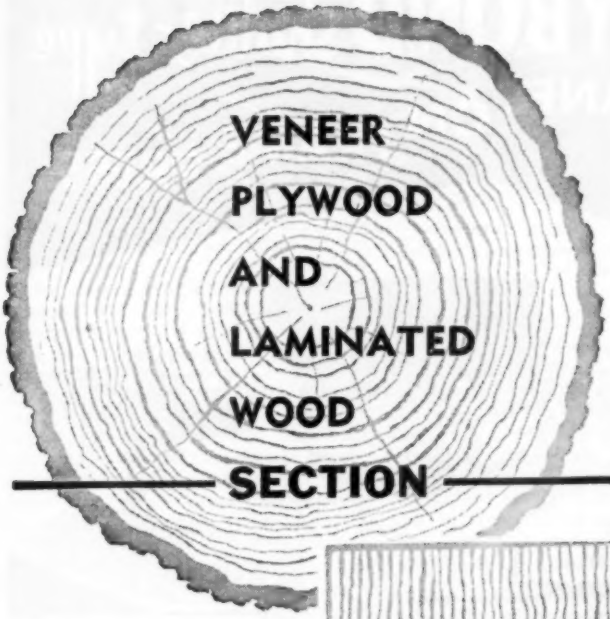


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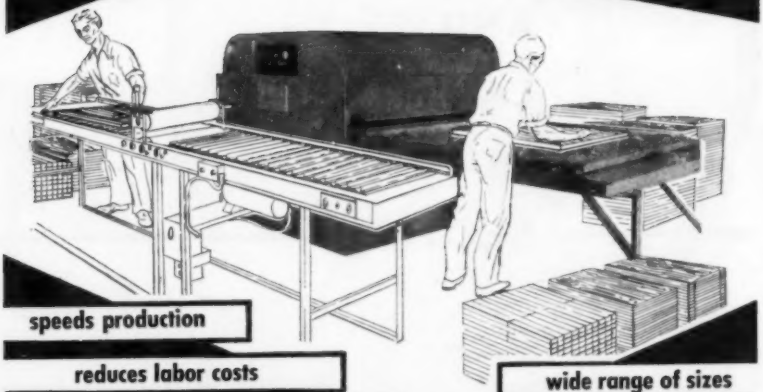

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# PLYWOOD *Is Better . . .* Veneer Yield Vs. Lumber Yield

By Thomas D. Perry

THE PROCEDURE of sawing flat square edged boards from round logs has been responsible for some rather curious calculations in the woodworking trades. Log scales were developed many years ago for the purpose of predicting the sawn lumber yield from a log of a given diameter at the small end. The attempt was made to determine the number of board feet that would result from a perfect log, properly sawn, disregarding whatever was lost in saw kerf, slabs and edgings. The results were eminently successful so far as saw logs were concerned. Sawmills were in operation long before rotary veneer lathes were developed, and hence the calculation of the log scale was based on sawmill operations, and failed to pay any attention to the potential yield in cutting veneer.

**Log Scales for Lumber**

One hundred years ago, even fifty years, there were many log scales, mostly local in character, and recognized principally in the area of their origin. Some were combined with others, many fell into disuse, and the few that survived gained wider and wider recognition. The bases on which these survivors were calculated is rather interesting:

**Scribner:** This is the oldest log scale still in use. It was based on diagrams drawn to show the cross sectional area of inch boards that could be sawed from logs of different diameters, after allowing, graphically, for slabs, edgings and saw kerfs. The content of the resulting boards was then computed and thus the log scale established. It is generally recognized that the rule is reasonably fair for lumber sawn from logs up to 28" diameter. Above that point the results are low.

**Doyle:** This is now more widely used than any other log scale, and in fact is now published in the Scribner Log Book. It is calculated by arbitrarily deducting 4" from the small diameter as allowance for waste, squaring one quarter of the remainder, and multiplying the result by the length of the log in feet. The sawmill overrun on this scale may be as much as 25% on small logs.

**Doyle-Scribner:** This is the official rule of the National Hardwood Lumber Association of the United States, using the Doyle Scale up to and including 27" diameter logs, and the Scribner Scale for 28" and up.

**Spaulding:** This is established by law in California, is widely used on the Pacific Coast, and does not differ significantly from the Scribner Scale. It was originally computed from carefully drawn diagrams, from which waste factors were eliminated, and by essentially the same procedure as employed in developing the Scribner Scale.

**British Columbia:** This is authorized by law in British Columbia. It is computed by deducting 1½" from the small diameter: this is squared and divided by .7854 to find the area: three-

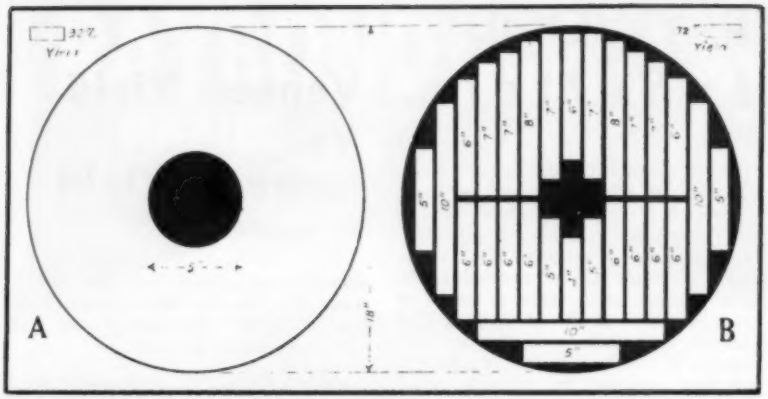


**Fig. 1. Veneer yield contrasted with lumber yield. A. Veneer yield, with 5" core, equals 92%. B. Lumber yield on 4/4 boards, equals 72%.**

elevenths of this area is deducted and the remainder is divided by 12 to reduce to board feet. The result averages about 5% below the Spaulding Scale.

### Applying Log Scales to Veneer

It is quite obvious that cutting rotary veneer from a round log is a more logical procedure than converting the round log into lumber of rectangular shapes. There is no saw kerf and the only waste factors are the central core of heartwood, which seldom produces good lumber, and also the preliminary "round-up" to obtain a true cylinder, from which continuous sheets of veneer can be peeled. The mathematical result, based on actual cubic content, and disregarding log scales, is shown graphically in Fig. 1. This bases the sawmill operation on 4/4 thickness, and the veneer cutting on the discarding of a 5" diameter core, both applied to an 18" diameter log. The lumber yield of 72% as well as the veneer yield of 92% are both based on a perfect log, without defects. However, any defects will have the same effect on lumber yield as on veneer yield so that the comparison can be considered realistic. Corresponding veneer yields for variations in core diameters are as follows, for typical sizes in hardwood (18" D.) and softwood (30" D.) veneer operations:

| | Hardwood 18" log Yield | Softwood 30" log Yield |
|---|---|---|
| 4" core | 95% | .... |
| 5" core, as in Fig. 1. | 92% | .... |
| 6" core | 89% | 96% |
| 7" core | 85% | 94½% |
| 8" core | 80% | 93% |
| 9" core | 75% | 91% |
| 10" core | .... | 89% |
| 12" core | .... | 84% |
| 15" core | .... | 74% |

**Last month we concluded Tom Perry's series on Veneer & Plywood Machinery.**

**Write the editor if you would like a reprint of the series.**

However, the log in the veneer factory has been bought and paid for on a log scale basis, and so far as the factory and cost records are concerned, that is its practical content, even though the following discrepany exists for a log 16' long and 18" or 30" diameter at the small end:

| | 18" log | 30"log |
|---|---|---|
| Cubic content, actual ..... | 339.29 b.f. | 942.48 b.f. |
| Log scale, | | |
| Doyle-Scribner ... | 196 b.f. | 657 b.f. |
| Spaulding ..... | 216 | 656 |
| British Columbia.. | 207 | 619 |
| Averages of log scales ..... | 206 b.f. | 644 b.f. |

The practical result is that the veneer factory has actually received more footage than it has paid for and will benefit by overruns, as they are called in the trade. This is an entirely different situation than that faced by the sawmill operator, who will derive approximately the same lumber footage, as he has paid for in log footage.

### Overruns In Veneer Cutting

This phenomenon of veneer overruns is not as well understood in the industry as it should be, since this extra yield is a real source of substantial profit in veneer manufacture, as well as in the secondary utilization of veneer in the plywood industry.

There are several variable factors in this overrun; the log scale used, the size of the log, and the diameter of the discarded veneer core. However the graph in Fig. 2 indicates the total yield of veneer according to Doyle-Scribner Scale, on logs from 12" to 60" diameter. The top dotted line is the total gross yield, assuming there was no core remaining. Lower graph lines indicate the veneer yields when 4", 6", and 8" diameter cores are discarded. Corresponding graphs for other log scales follow a very similar pattern.

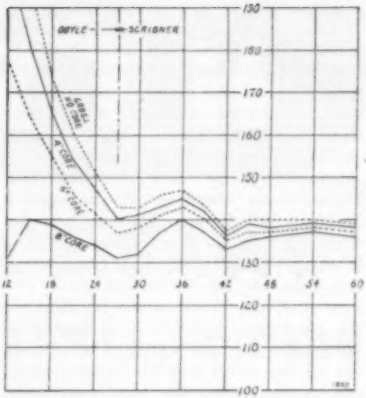


**Fig. 2. Veneer overrun, based on Doyle-Scribner log scale. Horizontal: diameter of log scale, i.e., 130=30% overrun, beyond that of the log scale, which is represented by 100%.**

For log diameters above 24" the overrun is fairly close to the 40% line. In logs below 24" diameter, with 4" to 6" cores, the overrun is considerably higher. Normally it is impractical to cut below a 6" core on log bolts 6 to 8 feet long, but many of the more progressive mills in the hardwood field, take these 6" to 8" cores, saw them to half lengths and continue cutting veneer, suitable for crossbanding, down to a 4" and sometimes even a 3" core. This requires a small auxiliary lathe, with automatic centering devices, so that very little veneer is lost as the result of the transfer from the large to the small lathe. This recutting of cores is only possible in species that normally have sound heartwood, such as birch.

In the softwood field, Douglas fir, etc., the situation is quite different, since cores resulting from Douglas fir logs incline to be defective, and sometimes have to be discarded before reaching the minimum diameter for which the lathe procedure has been set up.

**Revision of Log Scales**

There has been considerable agitation, over the years, for a more realistic evaluation of the veneer content of a log than is now expressed in the time tested log scales, which were originally developed for sawmills, and still serve satisfactorily for this intended use. Theoretically there should be such a revision, which would mean one log scale standard for sawmill logs, and another and different log scale for "peeler" logs intended for the veneer plant. The urgent advocates of such a revision are the producers and sellers of logs, who claim that they are not now being paid for all the wood that the veneer cutter can obtain from the logs purchased. There is no denial that there is considerable logic in this claim. Some go so far as to insist that the buyer's market created by this inequality is a rank injustice, since it never shifts alternately, as do most markets, from a buyer's market to a seller's market, in a way that balances the extremes.

There are, however, three good reasons why such a revision has not been accorded more than nominal and lukewarm support, and probably will not occur.

**First:** Traditions in an age-old industry like that of lumbering and woodworking are very strong. The present log scales, as they are recognized by usage, or authorized by law, or adopted by trade associations, have been time tested, and their operation, whether right or wrong, is well understood by everyone and their limitations are recognized. Attempting to change these well established customs would require strong public opinion behind it. Any such change would cause endless confusion and fundamentally alter the habits of the industry.

**Second:** Statistics show that some 80% to 90% of the logs harvested in the woods go to the sawmill for conversion into lumber and kindred wood products. With this heavy majority of log producers, serving the sawmill trade, who are satisfied with the present log scales that meet their needs reasonably well, the chances for revision for and by the minority of log producers serving the veneer mills, is far from hopeful.

**Third:** There would be much confusion in log producing areas if two log scales were in use, one for lumber and one for veneer. The same crew fell the trees that are cut into logs for conversion into lumber or veneer, and there is no distinction between the types of logs as they are piled and hauled to the mills. A log is a log and contains just so many board feet by log scale. Somewhere along the production line, usually fairly close to the mills, there is a sorting of logs into those for saw logs and for peeler logs. Prior to this sorting the woodsmen have little, if any, knowledge of which is a saw log or a veneer log, and any attempt to apply a duplex scale would be meaningless. After this sorting by trained inspectors there is a distinction in quality, often indicated by stamping grade marks on the ends of the logs. If after such a sorting, the log scale on a veneer log was to be arbitrarily stepped up 20% or 30% or 40%, all records would inevitably become confused and production records would lose their value. No reasonably minded log buyer or seller wants to precipitate such an involved situation.

As a consequence, log scales are still log scales, and their revision, whether logical or reasonable, is still a long way in the future. Many imported logs and some domestic figured butts and crotches are sold on a cubic content or weight basis, but the over-all percentage is very small. Some minor adjustments are constantly being made in log

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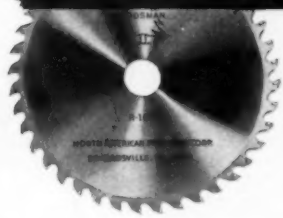

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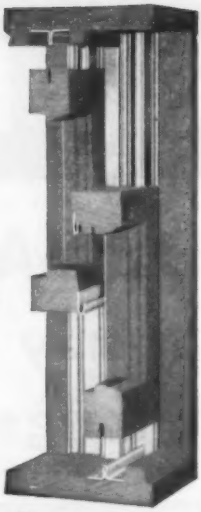

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scales, but the fundamental principles remain as they were.

A familiar simile to the log sorting mentioned above might be cream and skim milk. The peeler logs are skimmed off from the saw logs and command the higher price, just as cream is more costly than skim milk, but the same quart measure applies to both. This higher price for peeler logs appears to be the most practical method of adjusting the obvious inequalities of potential yield, into veneer as contrasted with lumber.

**What About Sliced Veneers?**

This discussion about veneer yield, so far, has been based on rotary veneer, where all saw kerf is eliminated and the major item of waste is the central core. Sliced veneer is sawed into flitches and some of the slab wood is removed. In many species much of the heart wood is sound enough to be converted into salable veneer. However, sliced veneer is usually cut in such a manner as to produce figure, rather than for gross yield without regard to attractiveness. Maximum yields are not a major consideration. However, it remains true that cutting sliced veneer will usually overrun the log scale by substantial percentages. The opinion prevails, although there are no statistics to prove it, that the footage of logs sliced into veneer is a mere 2% to 3% of the total log supply. Other authorities claim that of the 100% of logs cut into veneer, only 10% or less is sliced, while 90% is rotary cut. Sawn veneer, while still sometimes available is insignificant in amount. Sawn veneer has very low yields, since more is wasted in saw kerf than is produced in veneer.

**Cost Comparisons**

It has not been the purpose of this article to express an opinion that wood, in the form of a board, is more costly or less costly than the same amount of

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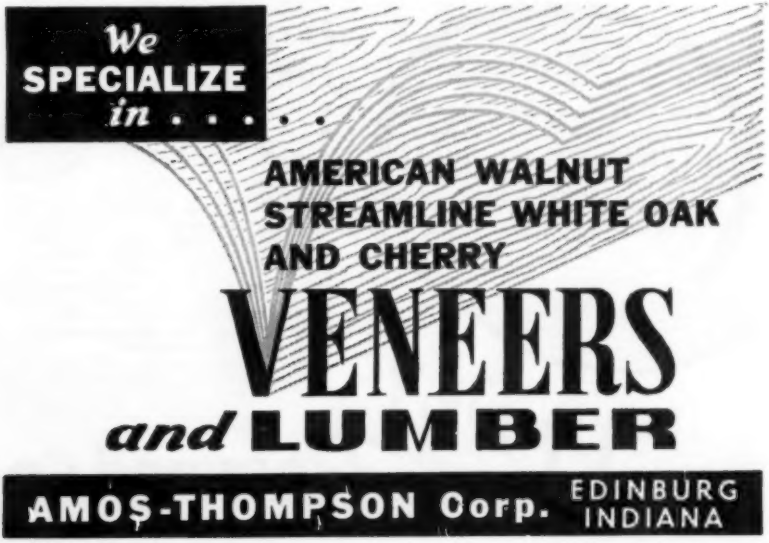
wood cut into veneer and glued into plywood. A single board foot of wood processed no further than as lumber is hardly comparable to a single board foot of plywood in which the veneers have been supplemented by additional labor and glue. However, this labor and glue have added qualities that unprocessed lumber does not possess. As an example, a square foot of plywood, ¼" thick will often serve as an equivalent of a board foot of lumber, containing four times as much wood. The fact that veneer logs cost more than saw logs, even though they overrun the log scale in the lathe operation, would distort any cost comparisons.

Costs must be related to utility and serviceability. If the net bulk of wood, by cubic content, in one board foot of lumber can be stretched out to make four square feet of ¼" plywood, it may well be a cost advantage, even if not a true cost comparison.

**Yield Comparisons**

Yield is the category in which the normal conversion of the log into veneer and plywood far outstrips the corresponding conversion into lumber. As a matter of fact, the differential of 20% (92%—72%) shown in Fig. 1 applies to boards that are a plump 1" thick. A substantial amount of both hardwood and softwood lumber is kiln dried and planed to a standard 13/16". These processes can cause a further decrease of nearly 20%, or a total of about 40%, in the yield differential between 13/16" lumber and rotary cut veneer glued into plywood. Again it should be noted that natural and processing defects may alter this differential which is mathematically calculated. Nevertheless, the modifications in yield, due to defects, will be reasonably equivalent in either lumber or veneer.

Whether we are consuming our forest resources at a rate that exceeds normal

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growth, or are building up a reserve supply in standing timber, may be a moot question, but with the better control of insect depredations and with more adequate fire protection, the opinion is rather general that our forest resources will last for many generations to come.

It is the responsibility of each generation to utilize its timber resources with maximum efficiency. With the growing demands of the veneer industry there is also a growing scarcity of prime peeler logs. Many of the top grades of what were once considered saw logs now find their way into veneer mills.

This puts the burden of efficient conversion on the wood using industries. There is significant awareness that this responsibility is clearly recognized, a fact that is demonstrated by the growth of the plywood industry.

Another indication of the determination of the woodworker to utilize logs with maximum efficiency is the development of chipboard. This is distinctly a by-product, converting slabs, edgings, cores, and to some extent sawdust shavings and branches, into a useful minor product.

The fact remains, however, that the conversion of the log into veneer produces a higher ratio of major product, which is of distinctly greater value, than does the conversion into lumber with its necessity of remanufacturing its by-product into chipboard. There may be a question whether enough attention is placed on using veneer and plywood wherever it is practical, in preference to solid wood.

**Conclusions**

The facts of a 20% (plus) yield advantage for veneer and plywood over lumber are indisputable, and a commendable trend in the right direction is shown by the growing acceptance of plywood. But there is far too little general recognition of this differential. Greater emphasis is imperative if we of this generation are to improve our conversion efficiency for the benefit of the generations that are to follow us.

Prodigality in the conversion of natural resources is never defensible and inevitably penalizes those who will want to use wood products in the years ahead!

---

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## Hoosier Panel Company Supplies Panels

INDUSTRIAL plywood is produced in a wide range of constructions, of many different woods, and in all sorts of sizes and thicknesses, to meet the particular needs for which the panels will be used.

This diversity of product is well illustrated in the operations of Hoosier Panel Company, New Albany, Indiana. On any given day, the production at this firm may include panels for such widely varying applications as store fronts, fixtures for store interiors, typewriter tables, airplane parts, piano cases, piano benches, kitchen cabinets, and card tables. For each of these applications, the plywood specifications may be entirely different.

### Cabinet Plywood

The making of plywood for these special applications, however, does not constitute the major manufacturing activity at Hoosier Panel Company. The product which the firm produces in largest volume is cabinet plywood—predominantly hardwood panels for use in making radio and television cabinets. A. O. Binford, president and founder of the firm, points out that this is a case of normal business evolution.

"It is an outgrowth of manufacturing operations which began nearly 40 years ago," President Binford explains, "back when the phonograph was changing from a box with a megaphone on top, to a self-contained unit, designed as an attractive piece of furniture. Hardwood veneer panels from our plant went into the cabinets of many of these early phonographs. With the passing years, as phonographs have been replaced by radios and television sets, the demand for hardwood veneer panels for cabinets has expanded greatly, and Hoosier's long experience in the field helped to establish the company as a leading supplier of this type of plywood."

### Veneer Preferred

There was a time when people generally regarded veneered furniture as an inferior substitute for solid wood construction. Basis for this feeling was, of course, the fact that early veneering did not adhere well. Glues and applications were to blame for this and the industry has worked hard to perfect glues and improve applications in order to overcome this criticism.

The advent of modern resin adhesives, coupled with the improvement in manufacturing methods—developments of firms such as Hoosier Panel Company—removed these objections and plywood panels are now preferred for fine furniture. Fine face veneers provide an almost infinite variation in grain con-

**When the flitches of veneer arrive in the Veneer Department at Hoosier Panel Company they are opened and inspected for quality. They are also tested for moisture content, as shown here. If the moisture is too high, the veneer is sent to a drier.**

figuration and the great strength and freedom from warpage, inherent characteristics of plywood, enable the furniture maker to produce merchandise of unexcelled quality.

The two basic classifications of plywood—lumber-core and veneer plywood—are produced in Hoosier's New Albany plant.

Face veneer for either lumber-core or veneer plywood is 1/28" thick. Slightly heavier stock—usually 1/20"—is used for panel backs and for the crossbanding of lumber-core plywood. The thickness of the interior layers of veneer plywood may vary within wide limits according to the properties needed in the finished sheet.

**Custom-Made Plywood**

An outstanding characteristic of industrial plywood is the way in which the construction may be altered to meet the requirements. This is particularly true with the lumber-core type of product. The individual strips of glued-up core are generally not more than three inches wide, but the arrangement of these strips may be varied in any of a number of ways. The simplest construction, of course, is that in which the strips are glued together, edge-to-edge, to make up the required width. In this case, the end grain of the core is exposed on each end of the panel. If finished edges are required, strips of face veneer may be bonded to the exposed end grain.

Exposed end grain may also be avoided by making the outside of the core in the form of a frame, mitered at the corners.

In some cases, the core assemblies for small panels are glued-up in multiple, with continuous crossbanding, face and back veneers being used to cover two or more core units. This technique makes for more efficient production of small panels, and reduces handling requirements. It does demand, however, a high degree of accuracy in the construction of the core, to make sure that when the sheets are sawed apart, perfect panels will be obtained.

Since industrial plywood is so largely a made-to-order product, each order must be handled as a separate job all the way through the plant. This is a situation which production men in many fields would consider a scheduling nightmare, but Hoosier Panel Company seems to find it no problem at all. The company is equipped primarily for large production runs, but its organization is sufficiently flexible to handle orders of any size—from a few small special panels to thousands of full sized sheets.

To keep production flowing smoothly under these conditions, Hoosier has organized the plant into five departments—Veneer, Back and Band, Mill Room, Glue Room, and Finishing Room.

The veneer arrives in the Veneer Department in flitches. These flitches are

**Jointing the edges of lumber core stock, preparatory to gluing. Hoosier Panel manufactures both lumber core and veneer plywood, each in a wide range of specifications.**

opened and the veneer is carefully inspected for quality. It is also tested for moisture content, since veneer in which the moisture ratio is too high must be sent through a drier before it is suitable for use.

The veneer flitches come in random lengths—some as long as 16'—and the operation in which they are cut to the required length is a most important one. Defects are cut out of the veneer at this point, and the operator may work on several orders at once in order to make the best possible use of pieces of various lengths. It is also important that the sheets be kept in the proper order so that the grain will match when the individual pieces are bonded into a one-piece face for a panel.

**Edge Gluing**

This bonding involves gluing the edges of the thin veneer strips together —an operation generally performed on a Diehl tapeless splicer. As the initial step in this operation the strips of veneer, usually stacked together in a pad or "book" an inch or so thick, are passed through a machine which joints the edges and then applies a thin layer of adhesive. The glued edges of two of the strips are then placed together as they go through the tapeless splicer. The machine brings the veneer pieces into close contact as they move through an area where heat cures the resin glue. Only a few seconds are required for two strips to pass through the machine, but they emerge bonded with a strong and practically invisible joint. The operation is repeated until the required width of the panel face has been built up.

For the edge-bonding Rohm & Haas Company's special urea-formaldehyde resin is used. This one-component adhesive, known as Uformite JS-508 is supplied as a powder and contains both catalyst and the lubricant necessary to prevent sticking of the veneer at the heater bars. A feature of this resin is the latitude which it provides in assembly time. The spread veneers can be

**Jointing "books" of veneer in preparation for edge gluing.**

spliced immediately, or the bonding can be delayed for a considerable period —as long as three days in some cases. Thus weekend shutdowns of the plant do not require special provision for handling veneer that may have been edge-glued but not bonded at closing time.

Operations in the Back and Band Department are similar to those in the Veneer Room, although selection of the grain pattern is not essential in the preparation of these interior layers of the plywood. The edge-gluing operation is the same, however, and care in the choice of veneers is necessary to insure balanced construction of the panel.

The use of Uformite JS-508 for edge-gluing is an important application of a special purpose adhesive; but another adhesive from Rohm & Haas, known as Uformite 435, has far more general use in the plant. This resin is a stable, liquid urea formaldehyde adhesive, particularly suitable for bulk storage. Hoosier receives the resin in tank cars, storing it in bulk and pumping it to glue-mixing stations as needed. It is used both in the gluing of the core assemblies and in the bonding of the various layers which make up the plywood.

**The Mill Room**

Fabrication of the lumber cores takes place in the Mill Room. Rough lumber from the outside stacks where it is seasoned, is brought into the mill through dry kilns and is held in interior storage until needed for production.

The processing includes such typical woodworking operations as surfacing, jointing, ripping and cross-cutting. Special attention is given to the quality of the core lumber, for in top-quality plywood panels, no defects are allowed,

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**Glued-up lumber cores coming from the Panel-flo machine where the strips of wood are glued edge-to-edge to form a strong, dimensionally stable core for the veneered panel.**

even in the cores. It is also important that each strip in a core assembly be of essentially the same grain pattern in order to insure dimensional stability.

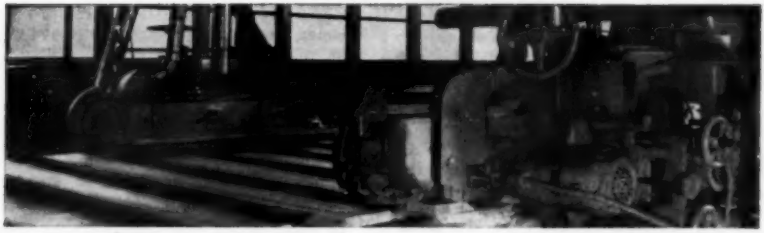
Most core assemblies in the Hoosier plant are bonded on a Panel-flo machine—a high production piece of equipment which combines glue spreader, clamps and curing oven in what is essentially a single unit. The Panel-flo is manufactured by the James L. Taylor Co., Poughkeepsie, N.Y. The strips for each panel are placed on a conveyor which carries them over the glue spreading roll to a moving chain that takes them through the oven. Automatic clamps within the oven apply vertical and horizontal pressure simultaneously as the strips travel through.

In order to provide for separation of the individual panels as the strips are fed into the Panel-flo machine, no resin is applied to the last strip of each panel. Thus, while the strip is bonded to the panel to which it belongs by the glue on the adjacent strip, it forms no union with the unglued outside edge of the first strip of the next panel. On long production runs of cores of the same size, however, no such separation is provided. Each core strip is bonded to the one next to it and the resulting solid ribbon of glued-up wood emerging from the oven is cut into the required width for a panel by an ingeniously arranged saw attachment, just outside the oven. This saw is synchronized with the speed of the chain which brings the core stock through the oven, and is set at a slight angle that enables it to make a square cut across the slowly moving stock.

**Assembly of the Panel**

Assembly of the various parts of the panel into a finished unit takes place in the Glue Room. The procedure varies with the types of plywood being made but the basic steps used in building up a five-ply panel are typical. The crossbands are run through a glue spreading machine which coats them on both sides with Uformite adhesive. Then the panels are built up—back, crossband, core, crossband and face. The procedure is routine, but it is also exacting, especially if the plywood happens to be in the form of square panels. Then care must be exercised, not only to insure that the proper sequence of layers is maintained, but also to keep the grain direction of each layer properly oriented. The grain of the crossbands must, of course, be at right angles to the grain of the face and back.

After the panel assemblies have been completed, they are placed in a hot-



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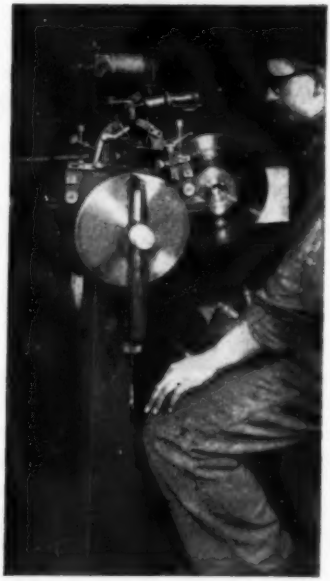

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In cases where the specifications call for complete water resistance, such as in plywood that will be used on store fronts or the thin veneer panels required in aircraft work, Hoosier uses Tego resin film rather than urea formaldehyde glues. Tego is another member of Rohm & Haas Company's family of adhesives—a phenolic resin for hot press curing that is produced in sheet form. The film is approximately .005 inches thick, and is supplied in rolls in either of two standard widths—50" and 74".

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### Finishing

After the panels have been bonded, they go to the Finishing Room. Here they are trimmed to exact size on precision saws, and are then carefully surfaced on sanders. The backs of panels

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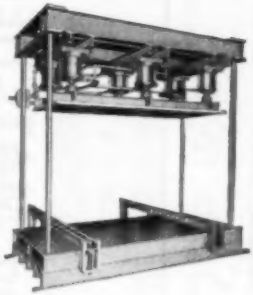

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- Other sizes, openings and pressures built special to meet the requirement.
- Equipped with combination oiler and filter, presure regulator with gauge, speed control, and hand- or foot-operating valves ready to connect to air line.
- Choice of air, air-hydraulic or hydraulic powering.
- Union also designs and builds all types of loaders as illustrated to meet any press-feeding need.

Complete data mailed on request.

*UNION Serves Over 2,500 Satisfied Customers*

**UNION TOOL CORPORATION**

300 E. MARKET ST., WARSAW, IND., U.S.A.

**USERS SAY UNION CUTS COSTS—SPEEDS PRODUCTION**


are finished by drum sanding, but the face is stroke-sanded with a belt sander in order to provide the best possible surface with a minimum loss of the face veneer.

The last operation in the Finishing Room is final inspection. When the panels have received the stamp of approval from these inspectors they are ready to be packed for shipment.

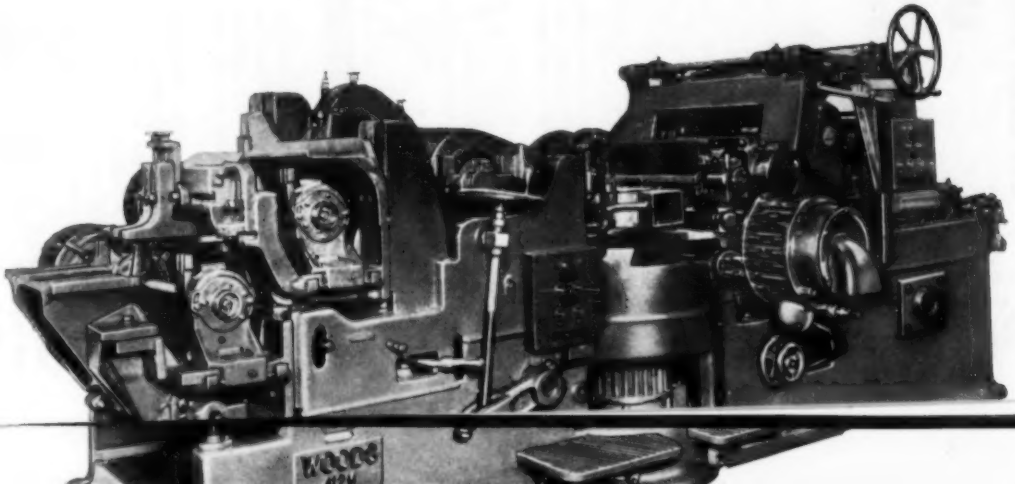
Through the years, E. E. Alexander, in charge of production at Hoosier Panel Company, has learned to accept the unusual as the ordinary situation in the plant. "On one occasion we made a plywood panel so wide and long that it had to be taken out through the side of the building and shipped in a special end-opening box car," Alexander recalls. "Another time we made panels for a Masonic temple, using veneer that was cut from the cedars of Lebanon. The veneer was considered so valuable by the customer that it was kept in a vault until we put it into production. We have made small panels of special construction with hickory faces for a table tennis champion who manufactures ping pong paddles, and we have worked with veneers from rare woods having such exotic-sounding names as Amboyna Burl, Bubinga, Ca-

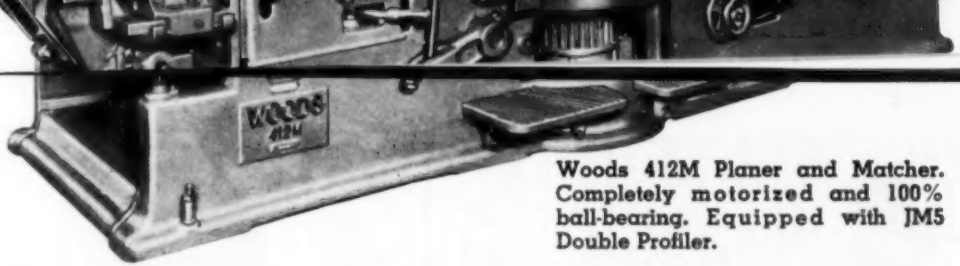
*Serving the Industry Since 1852*

# *It's Matchless!*

## This PLANER and MATCHER

*built by "The Planer of Woods"®*






Woods 412M Planer and Matcher. Completely motorized and 100% ball-bearing. Equipped with JM5 Double Profiler.

## This is what it will do for YOU!

★ *SET NEW PRODUCTION RECORDS —*

★ *CREATE HIGHER STANDARD OF QUALITY —*

★ *REDUCE MAINTENANCE COSTS —*

★ *CURTAIL DOWNTIME.*

*Send for new Planer and Matcher Bulletin*

# S. A. WOODS MACHINE CO.

27 DAMRELL STREET

BOSTON 27, MASS.

**Branch Offices:** ARK., Little Rock CALIF., San Mateo N.Y., Mount Vernon ORE., Portland TENN., Memphis VA., Richmond

**Canadian:** B.C., Vancouver, Akhurst Mchy. Co. ONT., Galt, Canada Mchy. Co.

**Export Dept.** United States Machinery Co., 90 Broad St., New York City

tivo, and English Grey Harewood."

Today, in keeping with the trend of the times, sheet plastic has been added to the long list of veneers used in the New Albany plant. Plastic-faced plywood for kitchen counter tops, cabinet doors, table tops or other special applications is produced on order. To Hoosier Panel Company, with almost four decades of experience as a manufacturer of industrial plywood, even the use of plastics does not seem a major change. It is just another way in which the firm is meeting the needs of the industry which it serves.

**This article appeared in the "Rohm & Haas Reporter" and is reprinted with permission.**

## SPLIT POLE BONDING

A new electronic high frequency process of lumber edge gluing, called "split pole" parallel bonding, has been patented by Julius W. Mann and George F. Russell of Tacoma, Washington.

This is their twenty-second patent in the field of high frequency heating, No. 2,678,897, issued May 18, 1954. It is the most recent of several processes invented by the Tacoma men relating to methods of, and equipment for, applying high frequency heat to industrial uses, the first of which was the basic "parallel bonding" process now widely used by, and licensed to, manufacturers of electronically edge glued wood products.

The new "split pole" parallel bonding process almost doubles the production of edge glued wood panels per kilowatt of radio frequency power. Employed in a continuous process, it makes possible the gluing of 25,000 board feet per 8 hour shift on a 6 foot wide machine through which random width lumber passes with the grain perpendicular to the direction of travel.

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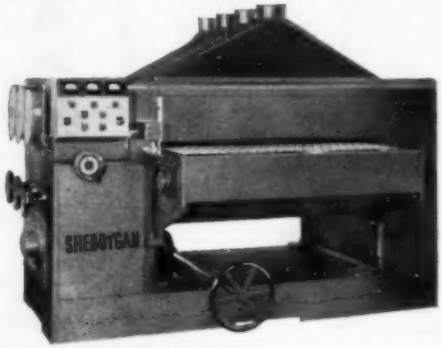
There is as much good sense required in knowing how to profit from good advice as there is in giving it.


**SHEBOYGAN**

**Endless Bed Sander**




**SHEBOYGAN MACHINE COMPANY**

**SHEBOYGAN** **WISCONSIN**

## WOODWORKING TOOL COMPANY ESTABLISHED

The Woodtools Company announces its formal opening in Beloit, Wis. The new company is operated by Carl Chekouras with the assistance of H. L. Fosbinder.

The Woodtools Company, along with supplying cutter heads, router bits, shaper cutters, etc., are exclusive manufacturers' representatives, in the Wisconsin-Illinois area, for the Peerless Saw Company of Columbus, Ohio, and the Stalter Edge Tool Company of Grand Rapids, Mich. The Woodtools Company also operates an engineering service for the wood-machining problems of the industry. Through their independent engineering setup they are in position to engineer cutting problems for machines of any make.

Carl Chekouras

H. L. Fosbinder

Carl Chekouras, operator of the company has many years' experience in the wood tool industry. He has held the position of chief engineer for Wisconsin Knife Works and later manager of Cutterhead, Knife and Carbide Tool Divisions of Yates American Machine Company. His great interest in "finger jointing" and carbide tooling has made him an authority in those fields. Hurbert L. Fosbinder comes to Woodtools from the Cutterheads, Knife and Carbide Tool Divisions of Yates-American. Fosbinder has for a long time been interested in the woodworking industry.

## CALIFORNIA OFFICE FOR ROCKORD COMPANIES

The Mattison-Greenlee Service Corporation has established an office at 514 Bryant St., San Francisco, Calif., for the purpose of serving the woodworking industry in Central and Northern California and Nevada.

This office will have the exclusive sales rights for the woodworking machinery as manufactured by the Mattison Machine Works, Rockford, Illinois, and Greenlee Bros. & Co., Rockford, Illinois.

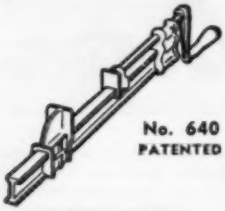
At the present time, the personnel of the San Francisco office will consist of C. C. Dwelley and L. C. Mattison. Mr. Dwelley for many years was connected with the Turner Machinery Company and is widely known throughout the California territory

Mr. L. C. Mattison has been connected with the Rockford sales office of the Mattison-Greenlee Service Corporation, and is fully acquainted with products of both Mattison Machine Works and Greenlee Bros. & Co.

## GALLAGHER TO NEW POST

Barney Gallagher of Memphis, Tenn., secretary-manager of the Southern Sash and Door Jobbers association for the past 3 years, will represent M and M

**NO MORE RUINED JOINTS FROM SLIPPING**



No. 640
PATENTED

**IMPROVED "I" BAR CLAMP**

Designed and constructed for hard every-day production. Its exclusive features make it the choice of the world's largest users.

BAR—Shaped to stand the greatest strain for the weight. Wide smooth flange will not mar the work.

NOTCHES—Formed in web, leaving the bar full strength as no metal is removed. Spaced ½ in. apart.

SLIDE—Malleable. Cannot slip or bind. Easily released. Heavy-tempered steel dog engages the notches making a positive stop and insuring years of service. Clamping surface, 2 x 1⅞ in.

TIP—Malleable. Hardened steel thrust bearing for end of screw, practically eliminating wear.

SCREW—Steel. ⅝ inch diameter especially treated with deep-cut "ACME" thread and long bearing, insuring long life. Crank handle steel with improved wood grip.

**WRITE FOR CATALOG of the Complete Line of Hargrave Clamps, Chisels, Punches, Star Drills, Brace Wrenches, Washer Cutters, and File Cleaners.**

**THE CINCINNATI TOOL CO.**
**1949 Waverly Ave., Cincinnati, O.**

**HARGRAVE**
*The Complete Line of Tested*
**TOOLS**


Wood Working company, makers of Malarkey products, in the Southeastern and South Central areas of the United States, General Sales Manager Robert Kelly has announced. Mr. Gallagher has resigned his position with the sash and door jobbers group to assume responsibility in the territory formerly held by the late Reed P. Morse.

## FAY & EGAN'S WOODWORKING MACHINERY LEASE PROGRAM

Lumber mills, furniture factories, wood product manufacturers, etc., will now find it possible to modernize their woodworking equipment without a major investment in new woodworking machinery. Fay & Egan Company, Cincinnati, Ohio, manufacturers of a complete line of woodworking equipment, recently announced a newly instituted Woodworking Machinery Lease Program. The New lease program, believed to be the first offered in the woodworking and allied industries, offers for rental all standard units Fay & Egan manufactures. This program is designed to supplement, not replace, Fay & Egan's policy of selling woodworking machinery outright or on an installment basis. While tool leasing has been in effect in other industries for many years, the basic idea and approach is new to the woodworking industry as a whole.

The Fay & Egan Tool Lease Plan is a five-year plan. The plan offers the privilege of purchasing the equipment for returning the equipment after a predetermined rental period. Fay & Egan retains title to the woodworking machinery during the length of the lease. Upon lease expiration Fay & Egan may release, rebuild, or dispose of the machinery at its discretion.

## MATER ENGINEERING FIRM ANNOUNCED

The organization of a new firm, Mater Engineering, of Corvallis, Oregon, was announced recently by Milton H. Mater. An affiliate of the manufacturing firm of Mater Machine Works, Mater Engi-

neering will specialize in engineering for sawmills and allied plants, design of plants and mills, the supplying of resident engineers for design and building of mills and the supply of construction millwrights for Mater designed and built mills.

The new organization results from the increasing demand for engineering in the sawmill and lumber field. Mater Engineering gives special attention to the design of modern, high production, low operating cost mills. Resident engineers supplied by Mater Engineering design mills at the site, oversee construction, handle purchasing and expediting of all machinery and materials needed for building the mill.

### N.O.F.A. MEETS

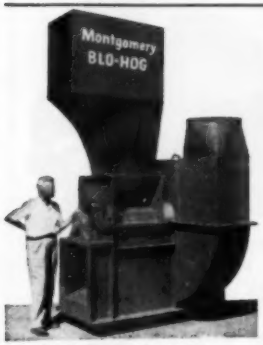
Henry H. Willins was named to the newly created post of executive vice-president of the National Oak Flooring Manufacturers' Association at the group's recent annual summer meeting in Memphis, Tenn.

With industry shipments in the first half of 1954 at a new all-time high for the period, the National Oak Flooring Manufacturers' Association has taken additional steps designed to assure the continued dominance of oak in the residential flooring market The group staged a "dress rehearsal" of its new sales clinic, discussed plans for its presentation before lumber dealer groups and voted to expand the association's advertising program.

### GLUING SCHOOL

Fifteen representatives of the lumber and wood product industries in ten states—from border to border, and coast to coast—have completed Teco's intensive five-day training course in gluing and wood utilization, held August 9-13, at the Timber Engineering Company research laboratory, Washington, D.C.

The 21st class since establishment of the course in 1949, the group included three key production men from Califor-


C.I.T. Terms Available

*Write for bulletin and details*

**JACKSONVILLE BLOW PIPE CO.**

*Jacksonville, Florida*

P. O. Box 3687

*The Marvelous Montgomery*

**BLO-HOG** (The only all-purpose hog in the world) Patents Pending

***EATS UP EVERYTHING***

. . . including Pine, Oak, Gum, Hickory, Elm, Cedar, Wet Veneer and Sandy Bark. Conveyor-fed — no attendant required. Positively protected from major damage by tramp steel. All connections locked — nothing to shake loose. Maintenance costs unbelievably low.

*". . . Dear Mr. Montgomery: It is an unbelievable machine and it is still hard to believe that it is actually handling the enormous volume of scrap we are feeding into it. We operate the hog without an attendant—which means a considerable saving."* — J. B. BLACK, Ocala Mfg. Co., Ocala, Fla.

Sumner Iron Works, Everett, Washington, W. Coast Rep.
Canadian Sumner Iron Works, Ltd., Vancouver, B.C., Canadian Rep.

nia plants, three from Florida plants, two from Kentucky, and one each from firms in Connecticut, Mississippi, New York, Pennsylvania, Virginia, Washington, and Wisconsin.

Also attending the course were three top-flight forestry school graduates who are receiving ten weeks of specialized training at the Teco laboratory on scholarships awarded them by the National Lumber Manufacturers Association, Teco's parent organization.

## SAUNDERS NEW SALES MANAGER

The management of the Penokee Veneer Company and the Splicedwood Corporation, Mellen, Wis., manufacturers of high quality veneers and hardwood plywood, takes pleasure in announcing the promotion of James W. Saunders to the position of sales manager.

Mr. Saunders is well experienced in the veneer and plywood industry and for the past several years was the midwest sales representative for the Penokee Veneer Company and the Splicedwood Corporation.

## SPECIFICATIONS FOR PALLETS

National Wooden Pallet Manufacturers Association, 215 Barr Building, Washington 6, D.C., announces two important industry developments of prime interest to all pallet users.

The first of these concerns the new

**Y18 is the only Machine That Sharpens Cross Cut Saws in One Operation**

Its patented and exclusive automatic swivel enables each tooth to be filed correctly as it comes along. Insures accuracy, keeps bevels true, points balanced and saw in perfect cutting circle.
Sharpen your saws, both cross cut and rip with Y 18, and *speed your productivity.*
Please write for Bulletin Y 18

WARDWELL
Maker of largest line of saw and tool sharpening machines

**Manufacturing Company**
**3801 Ridge Road**
**Cleveland 9, Ohio**

THE LARGEST
Popular Priced
HOTEL IN
LOS ANGELES
SENSIBLE RATES
Singles from $3.50
Doubles from $5.00
Twin Beds from $6.00
Free Parking
In the heart of the important downtown business and shopping districts, the Rosslyn offers more for your money than any other high class hotel ...Advance reservations accepted and definitely confirmed with no time limit on your stay... Special drive-in Auto Lobby ...You'll enjoy the perpetual sunshine of our Garden Sun Roof.
CIRCULATING ICE WATER IN EVERY ROOM
DRIVE-IN AUTO LOBBY
An Alberts Hotel
the ROSSLYN
111 WEST 5th ST. - LOS ANGELES

"Revised Minimum Standard Specifications for Warehouse, Permanent or Returnable Pallets," which represent several major departures from the original NWPMA Standards issued in 1949, and a general up-grading of the minimums. The new Standards establish for the first time two industry grades of pallets, set up a numerical system for pallet type designation, and place new limitations on fastenings, lumber requirements and manufacturing practices. They are intended for use as a base minimum for pallet purchasers. Copies of the revised specifications are available to all users without charge upon request to the Association.

The second development involves the adoption of an association brand or trademark, which is tied into the new Revised Minimum Standards. When this trademark appears on wooden pallet products it is an assurance to the purchaser that the product is of specified grade, and not less than the association minimums in quality. The brand also identifies the mill in which the pallet was produced, which will help purchasers to identify the sources of pallets which give the best performance.

---

You can't make dollars with quarters on an easy chair.

# Mechanics Through the Ages

**IN EARLY CHINA, "HAMS"** FASHIONED FROM WOOD AND COVERED WITH HOG'S SKIN, WERE "PALMED OFF" ON UNWARY BUYERS IN CHINA BY UNSCRUPULOUS DEALERS. THESE MAN-MADE "HAMS" WERE SO CUNNINGLY CONSTRUCTED THAT GUILELESS USERS USUALLY FAILED TO DISCOVER THE FRAUD UNTIL AFTER THEY HAD ACTUALLY TRIED TO *BOIL* THEIR "HAMS"!

*The Gaulish invasion* OF ROME (ABOUT 390 BC) WAS INSPIRED, IT SEEMS, BY THE VIVID STORIES OF ROMAN WEALTH AND LUXURY BROUGHT HOME BY A NATIVE BLACKSMITH WHO HAD LONG WORKED AT HIS TRADE IN THAT CITY!

**DURING THE REIGN OF** HENRY II, IT TOOK THE WOOD OF TWO OAKS TO PROVIDE SUFFICIENT FUEL TO OPERATE THE IRON FORGES OF THE ABBEY OF FLAXLEY FOR A SINGLE WEEK!

# Good News Gets Around...

## Moak Single Spindle Shapers and Speedikut Cutters

**TO MAKE FAST-SELLING SHAPED WOOD PRODUCTS**

**What a combination!**

***Moak Single Spindle Shapers*—with speeds up to 12,000 rpm, precision ground table, simple adjustments.**

***Moak Speedikut Cutters*—precision ground from hardened 18-4-1 high speed steel, undercut to maintain original balance when re-ground, and true form relieved.**

**Together, they produce rapidly and at low cost the various shapes for furniture, moldings, copings, cabinet-work, sash and paneling that add smart finishing to woodwork.**

***Get the facts* on Moak Shapers and Speedikut Cutters. Write for colorful illustrated booklets today.**

# The Market Place

**Rates for Classified Advertisements**

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and a five line advertisement. For additional lines, only 75c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.50; 2 inches, $17.00; 3 inches (Maximum), $25.00.

**Write directly to those offering the machine for sale,** for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill., making known your wants on either new or used machinery and the publisher will gladly assist you.

## FOR SALE

## S. W. Harrington, Inc.

**P.O. Box 230** **Asheville, N. C.**

Air Compressors, various sizes
**Bandsaw, American 38", bb. v-drive**
Band Saw, New Delta 20" bb. dmd.
Sand Saw, New Moak 26" bb. dmd.
Blowers, Sturtevant No. 70 & 55"
Borers, Greenlee 369-4 ft. M.D.
Borers, Greenlee No. 370 6 ft. horiz. dmd.
Borers, Moak 8S 2 Spdle. horiz. dmd.
Boring & Sawing, McKnight 26F dmd.
Clippers, Coe 88" bd. & motor
Dovetailers, Dodds, 10 & 20 spindle
Frequency changers, 30 KW dmd. and 15 KW.
Glue Jointer, Diehl No. 66 bb. dmd.
Glue Jointer, Jenkins No. 343A bb. dmd.
Jointers, Glue, Yates-American No. 213 bb. dmd.
Jointer, New Moak 12", bb. dmd.
Lathe, Yates No. 74 bb. dmd.
Lathes, Mattison 55C and 57D
Lathe Heads, Mattison Hex. T-slot
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 Vert. bd. & motor
Mortiser, New Britain No. 7, bd. & motor
Mortiser, W&M No. 288—5 spdle. Horiz. dmd.
Moulders, Hermance 7" pb. bd.
Moulders, Mattison No. 222, 6" bb. dmd.
Moulders, Woods No. 107—12" pb. bd.
Moulders, Yates-American C-4—8" bb. & motor
Moulders, Yates-American C-89—6" bb. dmd.
Planer, Facing, Yates-American 36" with Jackson & Church feeder on base, bb. dmd.
Planer, Whitney 36" sgl. rd. hd., bb. dmd
Planers, F&E—30" dbl. pb. bd. & motors
**Planers, Berlin 36", rd. hd. dmd.**
Planers, New Crescent 24" bb. dmd.
Planer, F&E No. 156 36x7 dmd. rd. head
Planer-Matcher, Yates A1-15"x6" rd. hds. pb. bd.
Redrier, Merritt 12 plate 36x72
Routers, Ekstrom Carlson No. 232 & Yates American A9 bb. dmd
Router, Defiance, 2 spindle bb. dmd.
Routers, Defiance sgl. spdle. high speed. dmd.
Sander, New Jefferson, hand block, bb, dmd.
Sanders, Mattison No. 134, pb. bd.
Sanders, Niagara brush, bb. dmd.
Sander, 48" double disc, dmd.
Sander, Smith 49" 3-drum endless bed, bd.
Sanders, F&E 60" 3 drum roll feed, dmd.
Sanders, McKnight sgl. drum 24"x16" dmd.
Sander, Oakley Model G2, bb. dmd. bd. block
Sander, Porter Cable vert. osc. dmd. sgl. spdle.
Sander, W&M No. 171 belt, bb., md.
Saws, DeWalt, 7½ hp, radial
Saws, Hermance Gang Rip, pb. & motor
Saws, Jenkins 105A dbl. cutoff bb. dmd.
Saws, New Delta-Crescent 12" tilt. arbor, dmd.
Saws, New Multiplex, 40A & 50A
Saws, Skilsaw, 2 hp. sgl. ph. radial
Shaper, Defiance dbl. spdle., bb. dmd.
Shaper, Whitney No. 389, dbl. bb. dmd.
Shapers, New Moak single spindle, bb. dmd.
Shapers, Greenlee No. 186 dbl. bb. dmd.
Shaper, Whitney double spindle, bb., md.
Sticker, American No. 1, 1 side 4" pb. bd.
Taping machines, Dennis No. 2
Tenoners, Yates-Amer. No. 55 sgl. end, bb. dmd.
Tenon Heads, single & double end
Tenoner, Hayes 6 ft. dbl. with copes, pb. bd. & motor
Veneer Press, Francis 84x48

**Many other items, send your inquiries**

AIR SERVICE VIA OUR OWN PLANE

## Randall Fenton and Co.

Plant Location
1500 S. Center

Mailing Address – Box 4065
**Tulsa, Oklahoma**

Telephone
85-1507

LARGEST DISTRIBUTOR OF NEW AND REBUILT MOULDERS

## Woodward Machinery Company
### 309 E. Second St. Cincinnati 2, Ohio

Band saw, G & K 36 in., MD., $175
Band saw, Parks 30 in., $125
Blower, Sturtevant, 30 in., $65
Borer, Nash, Vertical, 12 spdle. universal, $500
Borer, Fischer, 6 spdle. hor., 28", $350
Borer, 3 sp. Bell automatic, hor., $250
Borer, F&E hor. radial, 2 SP., NEW, $300
Cutoff saw, Porter swing, BB., MD., $150
Band saw filer, Wardwell, $75
Gang ripsaw, Luther 24", BB., $450
Grinder, Band resaw and brss. clamp, 8 in., $75
Lathe, Defiance 32 in. automatic, $350
Molder, Smith 7 in., 4 side, $450
Mortiser, B&M hor. gang, $185
Planer, F&E Heavy, 27 in. sgl. sec. roll, MD., $600
Press, Black Electric Glue, 48x72 in. $1350
Radial saw, DeWalt 1 HP SP, $150
Radial saw, Comet 5 HP, sgl. ph., $400
Ripsaw, Yates 61-2, st. line, BB., MD., $750
Ripsaw, Newman, self feed, in N.C., $250
Sander, drum and brush dbl. pneu., $50
Shapers, BB, MD, Sgl. small, $75 to $125
Sticker, Smith light, 6 in., 4 side, $250
Tenoner, Houston sgl. end, $100
Tenoner, Powers sgl. 2 copes, $200
Wood worker, Parks, 8 inchs., $350

## L. R. Kenner
### 3325 Trinity Road Louisville 6, Ky.

Belt sander, 6-ft. Mattison No. 124, auto. stroke
Boring Machine, P & B six-spindle horizontal.
Cut-Off Saw, Bell No. 216 str. line power feed.
Cutter grinder, Mattison No. 231 motor dr.
Dowel Driver, Bell No. 8, factory rebuilt.
Moulder, 6" Hermance No. 60 ball brg. m.d.
Planer, 20" American No. 666 Double, bb. mtr. dr.
Saw, Bell 12-C Dbl. Miter & cut-off for caskets, m.d.

**NEW — USED — REBUILT**

| | |
|---|---|
| Andrews 6' Multiple Borer | $450.00 |
| Dodds 12 Spindle Dovetailer | $450.00 |
| Walker Turner Table Saw | $250.00 |
| Sinker Davis Gang Rip | $650.00 |
| Oakley Jansen Belt Sander | $275.00 |

## BUCKEYE WOODWORKING EQUIPMENT CO.
**550 W. McMicken Ave., Cincinnati 14, Ohio**

## FOR SALE

THE "HART" LINE

Largest stock of used machinery in America, many ball-bearing, motorized. Substantial savings. Prompt shipment. Write for our list. We equip plants completely. We also buy complete plants or individual machines.

**Earle Hart Woodworking Machine Co.**
565 W. Washington Blvd., Chicago 6, Ill.
Phone RAndolph 6-4970

## USED AND REBUILT MACHINES
### PRICED FOR QUICK SALE FROM STOCK

**JOINTER**—20" No. 1 American Ball Bearing

**MORTISER**—Chain, New Britain No. 510 Hollow Chisel

**TENONER**—No. 2½ American Babbitt Bearing, belt drive

**PLANER & MATCHER**—16" No. 275 Fay & Egan

**MOLDERS**—9" No. 375 Fay & Egan, Babbitt Bearing
6" No. 206 Fay & Egan, Ball Bearing
10" No. 50 Hermance, Babbitt Bearing

**SURFACERS**—24"x6" No. 490 Fay & Egan Ball Bearing, Single
30" No. 32D Smith, Ball Bearing Single
26" Whitney Double cylinder, Babbitt Bearing, Flexible Roll & Chipbreaker, Motor Coupled.

**SHAPER**—No. 9 Buss Two Spindle, Ball Bearing, Direct Motor Drive

**BAND SAW**—42" No. 56 Fay & Egan, Ball Bearing
42" No. 186 Fay & Egan Resaw
30" No. 155 Ball Bearing Band Saw, V Belted Drive, Fay & Egan
36" No. 50 Fay & Egan, Ball Bearing

**CUT-OFF SAW**— No. 452 Greenlee Automatic

**RIP SAW**—Sinker Davis, Self Feed No. 75 Diehl, Chain Feed, Straight Line, Ball Bearing

**BELT SANDER**—30" No. 177 Yates American Double Surfacer-Babbitt Bearing

Your Best Buy is a Guaranteed Factory Rebuilt Machine
WRITE, WIRE or PHONE

## FAY & EGAN CO.
2023 Eastern Ave., Cincinnati 2, Ohio
Tele. PL-0730 Offerings subject to Prior Sale

## Clifton Machinery Co.
### 1023 W. 6th St. Cincinnati, Ohio

Saw Dust and Shavings Mill Exhausters and Blowers—Hundreds in stock, sizes to suit any need. Also Air Compressors, Fans, Rotary Blowers, Money Savers—Send specifications.

All machines rebuilt and fully guaranteed.

FOR SALE

## KILN DRIED CABINET WOODS.

**Any quantity up to carload lots. Immediate delivery or pick-up. Walnut, Cherry, Red and White Oak, Mahogany, Northern Birch, White Ash, Hard Maple, Poplar, Basswood, Prima Vera, Idaho White Pine, Red Gum, Cypress.**

**CHESTER B. STEM, INC.**
**439 Grant Line Road, New Albany, Ind.**

## A FEW GOOD POST-WAR MACHINES AT REALISTIC PRICES FOR IMMEDIATE DELIVERY

PLYCOR Hot Plate Press, 75"x50"—10 openings, complete with Cauls ready for operation.
WHITNEY No. 299 Automatic Shaper (No freq. needed)
OLIVER No. 170E-36" Straight-O-Plane
TAYLOR 66"x20' Panelflow
CURTIS HYDRAULIC Dbl. Belt Sanders
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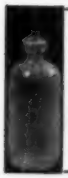

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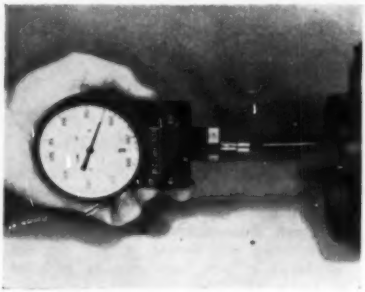

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6, 12, 16 and 20-in. Hand Jointers
Porter CM 16-in. Hand Jointer, D.M.D.
Diehl No. 60 Cont. Feed Glue Jointer
American 20" with 4-Post Feeder, M.D.

**LATHES**
Imperial Auto. Turning, D.M.D.
Mattison No. 55-C Ball Brg. Auto. Turning

**MORTISERS**
Wysong & Miles No. 284 P.F. Hollow Chisel
Fay & Egan No. 462 P.F. Hollow Chisel
New Britain No. 2 Chain Saw Mortiser, M.D.
Enterprise Ball Brg. Pulley Mortiser, M.D.

**PLANERS**
Yates No. 152, 24" Single Head, M.D.
Buss 36" Single Head, M.D.

**SANDERS**
Smith No. 401, 42" 3-Drum Endless Bed
Fay & Egan 48" 3-Drum Endless Bed
Sheboygan 49" 3-Drum Endless Bed, B-B
Nash No. 65 Automatic Turning Sander
Wysong & Miles No 173 Universal belt
Peerless 20-in. vertical belt sander, 5 H.P.

**SAWS - CUT-OFF - SAW TABLES**
Porter floor type, with table
DeWalt & Walker-Turner cut-off saws
Y-A No. 8 tilt arbor, roller table, M.D.
Hermance No. 2M comb. saw, B-B, direct M.D.

**SAWS - CHAIN FEED - SELF-FEED**
American No. 25 Chain Feed Rip, D.M.D.
Hermance No. 300-G Self-Feed, B-B, M.D.

**SHAPERS**
Porter No. 200 SVM Single, M.D.
Whitney No. 165 single, direct motor driven
Jones-Superior No. 105 Double End Serpentine
Onsrud W-123 auto. with frequency set

**TENONERS**
Hermance No. 22M All-Elec. Single End
Colladay-Power-Fay & Egan Single End

**MISCELLANEOUS**
Diehl No 60 Veneer Jointer
Doig Single Head corrugated fastener, M.D.
Yates-American No. 4 Sash Sticker, ball brg.
KVAL Model 110 Sizing Saw, 52" saw travel
GRUPP 25-in. Hyd. Feed Lock Corner Machine

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Moak 2 spindle Radial, Silverstreak
Root Single MD vertical
Root single vertical MD, Motor Feed
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Ingersoll-Rand, 5 HP
Westinghouse 5 HP

## DOVETAILERS

Dodds 10, 15, 20 spindle

## DOWEL MACHINES

Hawker No. 2 All Ball bearing & roller bearing VBD

## JOINTERS

American 12" Wedge Bed BB
American 16" Wedge Bed BB
Crescent 12" DMD
12" Colloday L. Powers, H. B. Smith, Crescent, Sidney
Northfield 12" DMD
Yates-American 16" DMD

## LATHES

Mattison 55C, BB, live tailstock

## LOCK CORNERS

Morgan 16" Camera lock corner with carbide tip cutters

## MORTISERS

Greenlee No. 228, Belt Drive
New Britain No. 2 and 7
Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

## MOULDERS

Mattison No. 224 9" all electric, hopper fd.
Mattison No. 262 6" Drop Bed, BB, all elec.
Sherrill 6" MD BB
Yates-American, 18" DMD C55, BB

## PLANERS

Buss 30" DMD
Greenlee No. 120 30" Double DMD DMF knife grinder
Monarch 20" CMD 5 HP with starter, New $675.00
Northfield 24" single, MD motor fd. No. 5
Whitney No. 32 36" BB CMD Knife Grinder
Whitney No. 32, 30" BB, Belt Drive
Whitney No. 29, 40" CMD, BB
Whitney No. 24, 30" Double, CMD
Yates-American B44 DMD sectional feed-flexible chipbreaker

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Ekstrom-Carlson 434
Onsrud Air
Onsrud 240
Porter No. 666

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Beach Hand Block MD 2 HP
Newton Edge Sander
Peerless 9", 14" and 20" horiz. & vert.
H. B. Smith 3 drum 4 motors No. 404 BB
Vonnegut vertical drum sander
Wysong & Miles, Oakley, Mattison belt

## SAWS

Fay & Egan No. 558 MD 1½ single phase
Toby T-12 5 HP motor
Crescent (extension base) V-belt drive
Tannewitz No. JDR DMD TA-revolving arbor 5 HP motors
Walker-Turner TA 5 HP motors

## SAWS - CUT OFF

Heston & Anderson No. 5, No. 25 & No. 55
Multiplex 5 HP DMD BB
Mattison No. 244 DMD BB 5 HP motor
Porter No. B43
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB

## SAWS - BANDSAWS

36" American, Tannewitz, Crescent, Oliver
30" VB Drive Crescent
27" Crescent Band Saw
32" Crescent guarded BB VBD
Fay & Egan 36", DMD, fully guarded
Northfield BB & DMD 20" to 36"
Yates-American B36 fully guarded DMD

## SAWS - RIP SAWS

American No. 25 Chain in Table
Mattison No. 202 straight line 10 HP motor
Tidey 48" carriage
Tidey 30" carriage & boring attachment

## BAND RIP & BAND RESAWS

Yates No. 281 Band Rip
Mershon 54" MD 40 HP motor tilting roll Band Resaw

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Northfield tilt arbor, DMD, 5 HP
Northfield Tilt Top DMD
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Collady SS BB 5 HP
Oliver No. 287 large top 7½ HP
Onsrud No. 200
Collady SS BB 5 HP
Whitney BD No. 89 single, large top
Whitney No. 202, BMD, 7½ HP, 4 work slides, automatic air holdowns
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Cut-off Saw, Irvington 5 HP Str. line
DeWalt 12 H.P. Radial Saw, 20" guard
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Jointer, 16" Famous, B.B. M.D.
Jointer, 30" American with power feed attch., DMD
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Planers, New Delta 13 x 5" B-C 12 x 4"
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Planer, Dbl. Whitney 30 x 7" M.D.
Planer, Dbl. Berlin No. 185-30 x 8" with motors
Planer & Matcher, Hall & Brown No. 209-15 x 6" Dbl. Profiler
Radial Saw, New Delta No. 40C and 50C, 2—3 and 5 H.P.
Shaper, Crescent Sgl. Spindle, New
Shaper, Whitney No. 134—Dbl. Spindle with frequency changer
Shaper, Buss Dbl. Spindle with motors
Sander, Belt, Beach Hand Block, D.M.D.
Sander, Belt, Fay & Egan Hand Block
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Sander, Yates No. 431-49" 3-Drum Endless Bed, B.D.
Sash Sticker, 6" Sgl. Head, One Side
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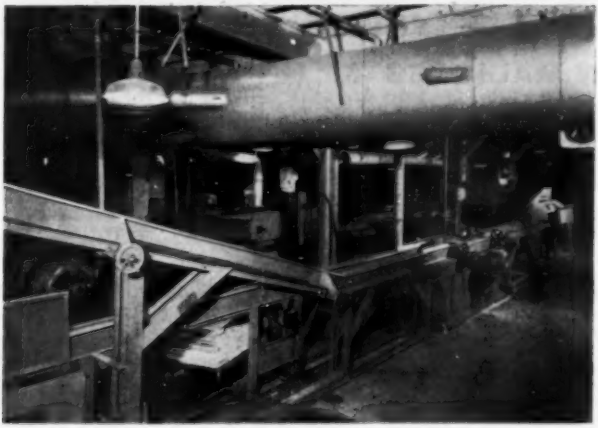

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Wysong & Miles No. 286 Hinge Seat Mortiser
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## MOULDERS

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Yates-American 4" Type C-88 Electric Moulder
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## SINGLE PLANERS

Buss 40" direct motor drive, ball bearing
Greenlee 36" No. 110 Direct Motor Driven
Whitney 30" No. 32 Direct Motor Driven Ball Bearing Planer
Yates-American 36" No. 1 Jointer with Hermog Feeder

## DOUBLE PLANERS

Buss 36" Double Planer
Yates-American 30" No. 177 ball bearing, direct motor driven with electric grinder
Whitney 30" and 36" No. 24 direct motor driven ball bearing, with grinder and jointer

## SANDERS

Mattison No. 124 Automatic Stroke Sander
Pearson Waterfall Sander
Oakley Model H Drawer Sander
Nash No. 50 and No. 25 Turning Sander

## BAND SAWS

Mershon 46" Band Resaw
American 44" Band Resaw
Yates-American 36" Type Y-36 motor drive, bb.
36" Yates-American Motor Driven Ball Bearing Band Saw
Yates-American Type V-54 Roller Brg. Band Resaw
Berlin 44" No. 283 Band Resaw

## CUT-OFF SAWS

Beach No. 3 Roller table double cut-off saw
Bell No. 24-B Double End Sawing, Boring and Chucking Machine
Fay & Egan No. 501-A Direct Motor Driven Ball Bearing Swing Saw
Eaglesfield Direct Motor Driven Ball Bearing Swing Saw

## RIP SAWS

Eaglesfield Direct Mtr. Dr. Ball Brg. Rip Saw
New Marion Glue Joint Rip Saw, in stock here
Mattison No. 202 Glue Joint Rip Saw
Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw
Yates-American G-67 Chain Feed Rip Saw

## ROUTERS

Yates-American U-9 Electric Router

## SHAPERS

Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Whitney No. 395 Double Spindle Automatic Shaper
Onsrud W-125 Double Spindle Automatic Shaper
Onsrud W-125 Single Spindle Automatic Shaper

## TENONERS

Yates-American No. 2½ Electric Tenoner
Jenkins No. 95 Electric, double-end
Yates-American No. 55 direct motor drive heavy duty single end tenoner

## VENEER MACHINERY

Francis 76" Hydraulic Veneer Clipper
Dennis Veneer Taping Machine, Motor Driven
Frances 84x36" hydraulic veneer press, M.D., with booster pump and overhead cranes
Merritt 13 Plate redrier 60 by 36

## MISCELLANEOUS

Salstrom 18-spindle Carver
Ekstrom-Carlson late mod. M.D. BB bedlock mach.
Wardwell Saw Filer
Morgan 7-track open back nailer with clincher
Williams Motor Driven No-Knife Hog
New Raiman Automatic Knot hole borer & plugger
Leitelt Lumber Lift
Mereen-Johnson No. 36 Auto. Boxboard Squeezer, 36"x56"

**Sutton WOODWORKING MACHINE CO.**

**PHONE 2-4186** **SEDGEFIELD INN** **GREENSBORO, N. C.**

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If you will list below the wood-working machines, supplies or machine shop equipment in which you are interested and mail this page to us, we shall be glad to refer your needs to the manufacturers or others in position to serve you. Replies will come from them — not from us.

If you have any special shop problems let us have the details. Often we can make helpful suggestions.

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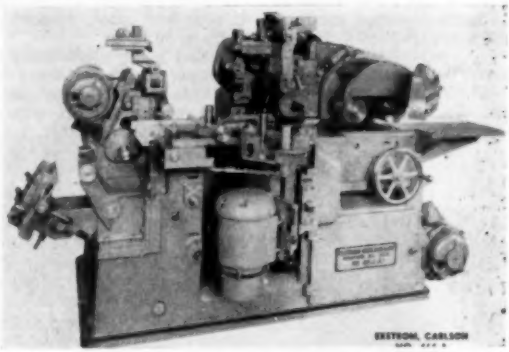
# EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

## EKSTROM, CARLSON MOULDER

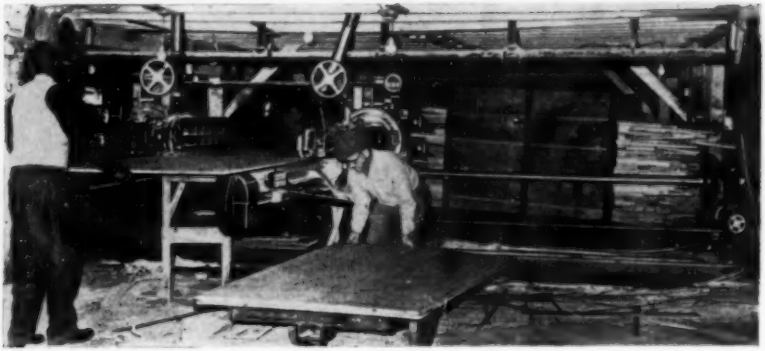


In this new moulder, No. 464-A, 6"x4", the Ekstrom, Carlson & Co., Rockford, Ill., has made a number of improvements. The moulder has a longer lower appearance with a reduced height for the stock guides giving better visibility and easier setups. There is a larger infeed table area and good sized handwheels for raising and lowering the top feed rolls. Bottom feed rolls are individually adjustable.

There are two jointer bars per set which makes jointing easier. All advantages of the "V" belt spindle drive and variable speed drive have been retained, but an extra length infeed stock guide extends almost to the side head chipbreaker—a great asset when feeding short stock.

In addition to the new features, and we have named only a few, there have been specification changes. Formerly the distance from the right side head to bottom head was 14½", now it is 18½". The swing of all heads was 9", now 9" on all except bottom head which has a 10" swing for splitting saws. Over-all length was 96", now it is 108". You can receive complete information and literature on this machine by writing to Dept. W-9 of the company.

## JOA-JENKINS TRIM SAW



Darlington Veneer Co., Darlington, S.C., has installed a 144" Joa-Jenkins trim saw to cut large plywood sections for prefabricated homes.

The equipment was designed and built by Curt G. Joa, Inc., at Joa's Sheboygan Falls, Wis., plant to Darlington Veneer's performance specifications.

Feeding plywood of any width from 5" up to 144" the Joa-Jenkins trim saw cuts at four rates of speed ranging from 18½ to 56 f.p.m.

Aided by an electrically lighted Magnescope which enlarges a measuring scale, the operator can set the saws to exact cutting width within 1/16" and can estimate to within 1/64".

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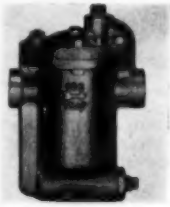
## NEW INTEGRAL STRAINER TRAP



Armstrong Machine Works, Three Rivers, Michigan, has added to its line of integral strainer steam traps, a new larger model designated as No. 882.

The new trap is said to cost less than a standard trap plus separate Y-trap strainer and fewer fittings are required to install it. It is recommended for use where dirt and scale conditions are bad.

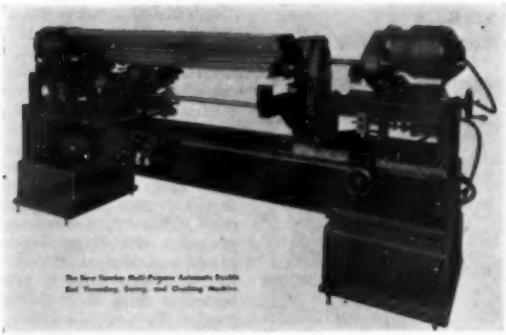
A stainless steel strainer screen is located in the body casting at the bottom of the trap. The No. 882 has horizontal and opposite pipe connections of ½" or ¾" size. Capacity ranges from 1300 to 2200 pounds condensate per hour. Maximum operating pressure is 250 psig. Except for the built-in strainer, the trap is identical to the company's No. 812 side inlet, side outlet trap.

## DOUBLE END THREADING, BORING AND CHUCKING MACHINE

A versatile new woodworking machine tool capable of performing as many as eight separate end operations on either square, round, or rectangular stock in one pass through the machine, is now in production at the Hawker Manufacturing Co., 1449 Keowee Street, Dayton 4, Ohio.

The machine is capable of performing any combination of eight of the following list of operations on each piece of stock as it is automatically indexed across the machine work table, at rates in excess of 2,500 pieces per hour.

(1) Cut stock to uniform length at either or both ends simultaneously; (2)



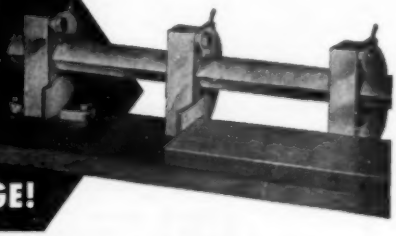
tenoning; (3) tapering; (4) rounding; (5) slot; (6) cross-boring and drilling; (7) end-boring; (8) threading; (9) countersinking and (10) counter-boring.

Several of these individual operations can also be combined through use of special tools or chucking heads to multiply the number of single operations accomplished.

The new Hawker machine weighs over 3,000 pounds, is ten feet long, three feet wide, and about four feet high. It has been engineered to make use of standard chucking heads, and make use of both air and electrically operated tools.

The machine will handle stock from 1′ to 5′ in length, and from ⅜″ to 1½″ in diameter. Special capacity machines are available to customer specifications.


**Increase CUT-OFF SAW Production**
**WITH A**
**COMET**
**ADJUSTABLE STOP GAUGE!**



**COMET Stop Gauges are faster because:** Stops can be positioned anywhere on the bar by hand. Additional stops can be added to the bar without dismounting it. Balanced stop trigger swings easily out of way when not in use.

**COMET Stop Gauges are more accurate because:** Cold rolled steel bar is engraved in ⅛″ steps and can not be marred by stop clamps. Machined stop trigger is set to mark—no guess-work on rough stop castings. Work forces stop trigger against block (not away) for perfect alignment.

**COMET Adjustable Stop Gauges** are available in lengths from 8 to 20 ft. All parts are heavily plated against corrosion. Can be used on right or left hand installations. Price of 8 ft. bar with four stops: $34.00, F.O.B. Los Angeles.

**Write for complete details to Dept. H-4.**

**CONSOLIDATED**
**MACHINERY & SUPPLY CO., Ltd.**
**2031 Santa Fe Avenue, Los Angeles 21, Calif.**

## NEW THIN KNIFE

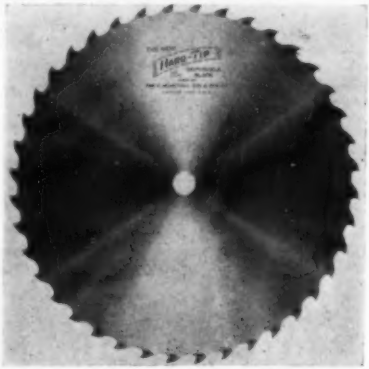
The Stalter Edge Tool Company of Grand Rapids, Mich., has announced the introduction of a new high speed steel thin knife. Mr. E. Stalter, president of the company, has completed field tests bringing out the advantages of the new knife. The knives will be offered under the name "Tungsten Temper."

The report of one of the recent tests, in a southern oak flooring mill, proved the new knives to provide a longer lasting edge, smoother jointing, easier grinding, positive setting and less grinding burn.

This selection of a premium grade high speed steel, heat treated by a newly developed process, assures the maximum performance provided in the new tools. To add to the efficiency of the new knives, the backs are sand blasted to provide a non-slip feature. The newly developed high speed steel will be used in all of the Stalter high speed "Tungsten Temper," thin and thick knives. The thick knives will not have the non-skid backs.

## DISPOSABLE SAW BLADE

George Heinemann of the F. Heinemann Saw & Mfg. Co., 2017 Navarre Rd., S.W., Canton, Ohio, has recently worked on a new theory regarding saw blades. Mr. Heinemann has analyzed and then developed a disposable saw blade. He claims this new blade will reduce sawing expenses from 50% to 60%. Each individually milled tooth of this new saw blade is especially hardened. This super-hardness of the teeth preserve the original condition of the blade and the teeth remain sharp four to six times longer. When the blade becomes dull, it is thrown away—discarded like an old razor blade.

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Complete information on cost, performance and comparison with other blades is available from the Heinemann Company. A report from the firm shows actual savings in cost and time.

**PORTABLE NAIL DRIVER**

A portable nail driver that has an automatic hopper feed, and that sinks each nail completely with a single stroke of its pneumatic driver, has been announced by the Morgan Machine Company, Inc, of Rochester, N.Y.

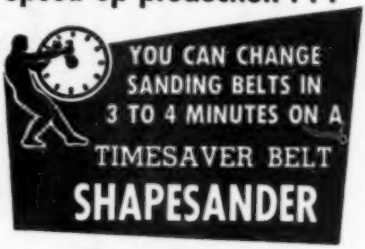
Using this portable nail driver, an operator can drive 40 to 50 nails per minute for sustained periods, and more than 60 nails per minute in brief spurts. These rates are about twice as fast as a skilled workman can achieve with a hand hammer.

The Morgan portable nail driver operates by compressed air, requiring 14.7 c.f.m. at 80 to 90 p.s.i. Such an air supply is readily available in most industrial plants, and on most large construction jobs.

The complete portable nail driver consists of a feeding unit weighing 65 pounds, a driving unit weighing 8½ pounds, and a length of plastic hose connecting them. The feeding unit is connected by standard air hose to the compressed air supply.

Nails used in the unit may range from 4 d to 8 d in size. They are aligned and fed by an air-driven oscillating hopper with a capacity of 8 pounds of nails.


**Speed up production . . .**



An entirely new concept in belt sanders, the SHAPESANDER cuts down-time to a minimum. One man can change the abrasive belt in a matter of minutes. This amazing sanding machine speeds up production all down the line, with users reporting savings in time as high as 80%. Not only is it a "Timesaver" but it produces the finest, smoothest finishes possible while giving users 50% longer abrasive belt life over other methods. Moderately priced and built in 4 sizes for all types of sanding production. Investigate the avantages of the SHAPESANDER for your shop or plant.

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**Rapid service**
**Constant quality**
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**GLUES**

You get the glues you need when you need them, and the quality your product deserves, when you specify RCI glues.

Reichhold makes a complete line of adhesives . . . urea-formaldehyde, phenol-formaldehyde, resorcinol, soybean, casein. Their performance is uniformly excellent. One of the ways we help assure this is by manufacturing such basic raw materials as phenol and formaldehyde to our own production standards.

Delivery is fast and reliable. North, south, east or west, there's an RCI plant within easy range of you by rail tank car or highway tank wagon. Technical aid is nearby too . . . from nationwide field service offices.

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Lumber core edge gluing with an RCI resin glue.

- Synthetic Resins
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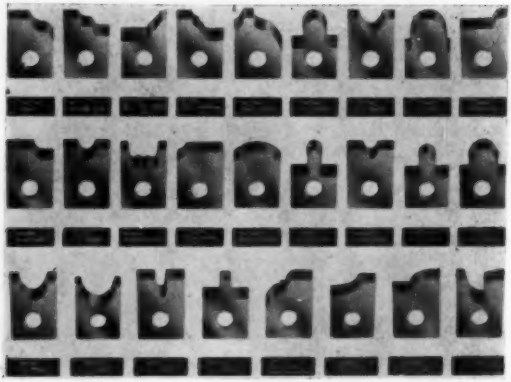
## DELTA DEVELOPS NEW MOLDING CUTTER KNIVES



A completely new set of 26 molding cutter knives enabling the user to make thousands of standard and original molding patterns has been developed by Delta Power Tool Division of Rockwell Manufacturing Company, 400 N. Lexington Ave., Pittsburgh, Pa.

Development of the 26 new models for use with Delta molding cutterheads on Delta and other makes of circular saws, brings the total number of Delta molding cutter knives to 53.

Used singly or in combinations of two or three or more the knives can be applied to such typical projects as picture frames, building trim, panel frames, case work, groove joints, drawers, glue joints, boxes, corner joints, molded corner joints, lock corner joints, reeding and fluting on flat work and table top edges.

Delta cutterhead sets are designed for use on radial saws and shapers, in addition to circular saws.

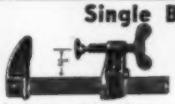
### SPEEDS REEL PRODUCTION

The purchase of an Onsrud model WB-85 automatic shaper by Union Wire Rope Corporation, Kansas City, Missouri, has aided materially, in stepped up production and improved quality of parts for use on reels up to 75" in diameter.

The reels manufactured by this company are used for winding heavy wire rope, for storage and shipping purposes.


HARTFORD CLAMPS
Since 1915

Single Bar Clamps

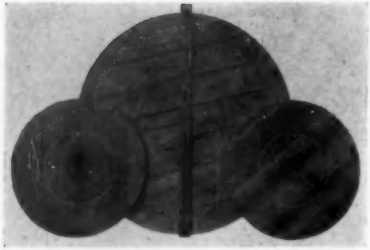


Style No. 16, adjustable head piece only

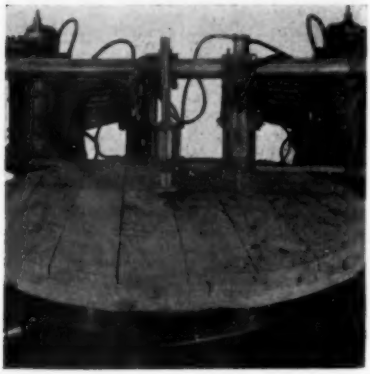
Style No. 17, adjustable tail piece only

Quick adjusting, self-locking and unlocking . . . both styles tested for safe clamping strain of 1800 lbs.

HARTFORD CLAMP COMPANY • EAST HARTFORD, CONN.



**Reels after one operation on the shaper are ready for assembly. Router head is seen attached to shaper. (Lower photo.)**



Union produces all size reels up to 6′ 3″ in diameter.

The new method of shaping a reel, 3′ in diameter x 2 11/32″ thick on an Onsrud automatic shaper takes approximately one minute. This includes shaping and beveling the outside diameter and routing an 18″ diameter groove along the surface of the reel. The previous method of cutting these reels was done on a band saw.

In a similar manner, the 6′ diameter x 4½″ thick reels are shaped. Three men are needed to lift the heavy reels to the table of the automatic shaper and one man operates the machine. The shaper is manufactured by the Onsrud Machine Works, Inc., 3900 W. Palmer St., Chicago, Ill.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SINCE 1886

**ROUTER BIT GRINDER**
**FOR**
**SHARPENING**
- **ROUTER BITS**
- **DOVETAIL BITS**
- **3 LIP CUTTERS**

**and Many Other Cutting Tools Including Carbide Cutters**

The primary purpose of this motorized, positive indexing Router Bit Grinder is to eliminate freehand grinding on hundreds of small cutting tools. The machine sharpens high speed and carbide cutters on an entirely mechanical basis, with extreme precision, saving cutter life and improving quality and quantity of production. Write for circular.

**Send Sample Bit to us for Free Sharpening**

*Manufactured by*

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**327 Dorchester Ave.**
**Boston 27, Mass.**

**FOREST HARDBOARD**

This new material, Forest hardboard Forall, manufactured by Forest Fiber Products, Forest Grove, Ore., is intended to solve door problems. It is a balanced product (warp resistant) and has a smooth, natural base for all types of finishes including enamel and light pastel color stains. The edge is easy to finish and the screw holding qualities are excellent.

The picture shows Harold Stroberger

of Western Wood Products Co., Portland, Oregon drilling a pilot hole. Drilling 75% of the diameter of the screw to be used when inserting into the face of Forest hardboard Forall (90% for edge drilling) substantially increases screw holding power. This smooth two-side panel is manufactured especially for wardrobe doors, cupboard doors, table tops. Forest hardboard Forall takes paint and stain finishes readily and is warp resistant.

**SAFETY GUARD FOR "POWER SHOP"**

A new safety guard has been perfected by DeWalt Inc., makers of the "Power Shop" line of radial arm type woodworking equipment for home, shop and commercial use. The guard is available in 9", 10", and 12" sizes.


**CONNECTICUT VALLEY FORSTNER BIT**

THE BIT THAT BORES AT ANY ANGLE . . . OR CUTS ANY ARC OF A CIRCLE

This bit has no center point, but is guided by its circular rim . . . consequently, it cuts any arc of a circle. In hand brace shanks from ¼" to 2", and in machine shanks from ¼" to 3".

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**CONNECTICUT VALLEY MFG. CO.**
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BURTON STEELHEAD BAND SAWS
Burton Saw Co.
WORCESTER 8, MASS.

LOG BANDS

Dealer Inquiries are Invited

• BAND RESAWS • NARROW BANDS •

Designed as optional equipment for those "Power Shop" users who prefer a saw guard which completely encloses the cutting member, the new safety device features an exclusive "free-floating" ring principle. Two circular rings, one on either side of the saw blade, are suspended on the regulation type guard in a manner so that no matter how the cutting member may be positioned, they automatically adjust themselves to the cut while still offering operator protection from the moving parts on the machine. This complete freedom of movement of the safety rings is the outstanding feature of the new DeWalt guard.

**WATER COOLED DOCTOR ROLLS FOR RESIN GLUE SPREADERS**

Black Brothers, now offers a resilient roll glue spreader arranged with the new type water cooled doctor rolls for use with quick setting adhesives. With this new arrangement employing special ball bearing rotary joints, the water now enters and leaves the roll at the same end. This provides a much simpler hook-up for the water connections, and also maintenance-free operation.

The increased use of catalyzed resin adhesives having a short pot life, especially during the hot summer months, has necessitated the use of water cooled doctor rolls.

---

Available in 9 convenient packages from 2 oz. to 50 gal. drums, DURATITE 3026 White Glue has improved versatility to produce better products at lower cost all the year 'round for the small package user. Resists high forced baking temperatures and is unaffected by repeated freezing and thawing. Always ready to use with quick, uniform setting regardless of shop temperatures. Extra strong DURATITE 3026 White Glue withstands up to 3000 pounds shear per sq. in. . . . sets in 15 to 20 minutes under mild pressure . . . ideal for all wood fabrication from wood joints to laminations and veneer, gluing synthetic and composition woods.

*Write for descriptive literature and prices.*

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***Plastic Duratite Wood Dough and Surfacing Putty are both water and weather proof with less than 1% shrinkage!***

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**ADHESIVES**
National Adhesives, pages 22-23, Literature.
Koppers Company, Inc., page 59, Booklet.
Perkins Glue Company, pages 80-81, Literature.
Webb Products Co., page 181, Literature.

**BITS & DRILLS**
Greenlee Tool Company, page 39, Catalog 34-M.
Alexander Dodds Co., page 187, Literature.

**BURNERS**
Rees Blow Pipe Mfg. Company, page 86, Bulletin 37.

**CLAMPS**
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**HOES**
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Boice Crane Company, page 78, Catalog.

**LUMBER**
Morgan Mfg. Company, page 94, Booklet.

**MOLDERS**
Dependable Machine Company, page 93, Bulletin C-12

**PLANERS & SURFACERS**
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Buss Machine Works, page 7, Bulletin 55.
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Baxter D. Whitney & Son, Inc., page 13, Bulletins.
Enterprise Company, page 71, Bulletin.
S. A. Woods Machine Co., pages 144-145, Bulletin.

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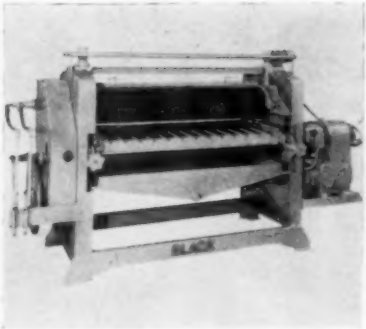
**TABLE EQUIPMENT**
B. Walter & Company, page 46, Folder.

**TENONERS**
Greenlee Bros. & Company, page 50, Bulletin 545.
Powermatic Co., page 84, Literature.

**WEATHERSTRIPPING**
Central Metal Strip Company, page 128, Bulletin.

**WOOD PRESERVATIVES**
Protection Products Co., page 10, Folder.



This arrangement is now being used on all of the latest model No. 22-D glue spreaders when desirable, and is available for installation on all of the older spreaders in the field. Further information can be obtained by writing the Black Brothers Co., Inc., P. O. Drawer 191, Mendota, Illinois.

## CARBIDE-TIPPED SAW PERFORMANCE

A switch four years ago from steel to carbide-tipped, cross-cut and rip saws is saving the shipping operation at General Electric's Switchgear Dept., in Philadelphia, $3,183 annually.

Short leaf yellow pine, a wood which is particularly tough on saws because of sand and mineral inclusions, is used for crating. Green lumber is used making the cutting even more difficult.

## COMBINATION SURFACER

Radically new in appearance, performance and features, a new combination surfacer, jointer and molder has just been announced by the J. A. Fay & Egan Company. Known as the Model No. 915, the new machine has a capacity of 24" in width and is one of a new "900" series being introduced.

When used as a jointer or molder, the conventional front and rear tables are


MEMO

Bob—
With the bit breakage we've had lately—we ought to give these a try.
—Jim

O. C. E. TRIMMERS & ROUTER BITS

At your jobber or builder supply ...always look for, always ask for the distinctive copper-colored bits and trimmers. Only these are O. C. E. tools—with diamond ground carbide-tipped cutting edges for smooth finishes and longest life.

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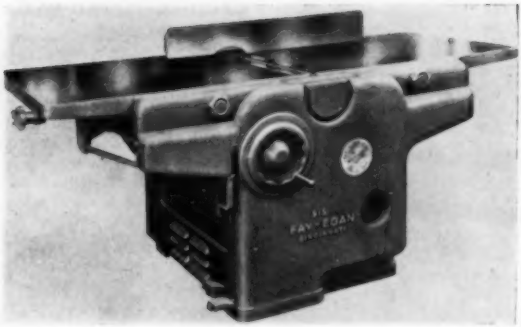


in place. The front table, of course, is readily adjustable to control depth of cut. When used as a surfacer, both tables are quickly pivoted out of the way, exposing the surfacing table which is also quickly adjustable with a large handwheel.

The No. 915 ball bearing, heavy duty combination surfacer, jointer and molder is constructed around a heavy cast-iron column which assures absolutely vibration-free work. The four-knife safety cylinder is dynamically balanced and runs at 5,000 r.p.m., driven by a 7½ h.p. motor mounted on a hinged base within the column.

Among other features pointed out by the manufacturer are: all controls within easy reach of operator; tables concentric to the cylinder; heavily ribbed tables; quick adjustment and easy, positive locking of tables.

The planing width of the machine is actually 24½"; planning thickness is 8". Surfacing speed, controlled by a foot treadle, can be either 26, 32, or 43 f.p.m. With variable speed drive available on special order, feed can be varied from 24 to 51 f.p.m.

For surfacing, the stock is driven through the machine by roller chain driven feed rollers. The cylinder is flanked by two oscillating pressure bars which keep the work centered.

Additional details on this machine, said to be "fully guarded and the safest in its class," will be furnished on request to the manufacturer, J. A. Fay & Egan Co., Dept. WD, Cincinnati 2, Ohio.

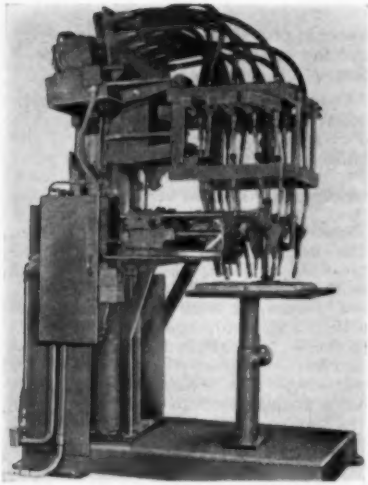
---

**CHAIR SEAT BORING MACHINE**

The J. M. Nash Company, 2360 North 30th Street, Milwaukee, Wisconsin, has announced a new chair seat boring machine, which is said to be remarkably versatile in its chair seat boring operation.

This machine, known as the Nash No. 71 chair seat bore, is capable of boring either the top spindle and post holes or the bottom leg holes in chair seats, doing these operations on a single machine instead of two distinctly different machines, which formerly was necessary on their old model four spindle chair seat boring machine for the bottom leg holes and the 8 or 12 spindle boring machine for the top spindle and post holes.

The uniquely efficient method of driving the boring spindles gives the machine remarkable versatility. The boring spindles are driven by means of flexible cables resulting in complete elimination of gearing. The advantage of using flexible shafts for the driving of the boring spindles is immediately apparent when pointing out the wide adjustment of boring spindles on the boring positions required on the chair seats. By the use of a U bracket, which supports the spindle stirrups, the boring



spindles can be located anywhere on the chair seat without throwing undue strain onto the universal joints due to extreme angularity adjustment.

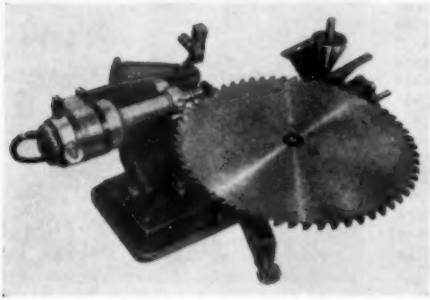
Chair seats with center locations up to 24" can be bored on this Nash No. 71 chair seat bore, and any pattern and series of holes within this maximum. On spindle boring for the top of the chair seat, centers as close as 1½" can be bored. On the bottom leg holes even the smallest chair seats can be bored, as the machine is adjustable to an extremely small pattern.

The accompanying illustration of the new Nash No. 71 chair seat bore shows the machine equipped with 15 boring spindles. It can be supplied with any number of spindles up to a maximum of 15. Should the manufacturer, who installs this machine, buy a minimum number of spindles others always can be added at a later date by purchasing spindle and drive assembly.

**PRECISION INCISING MACHINE**

The machine is of all steel construction, ruggedly assembled as a compact


# SHARPEN *YOUR OWN* SAWS



Pat. No. 435,691 June 10, 1954

Will grind both face and tops of teeth. Screw adjustments make for easy, trouble-free, fool-proof operation . . . even by inexperienced men!

**Now you can sharpen your own saws . . . faster, more efficiently and more economically, too! The new Huther 142 Carbide Saw Grinder enables you to eliminate the inconvenience of delays and the expense of down time. If you have three or more carbide saws, this machine will pay for itself in a hurry. And if you operate a medium or large shop, you simply cannot afford to be without the new Huther 142 Grinder . . . which will sharpen any saw from 6" to 24" in diameter. Low in price, economical to operate, easy to use and dependable. Write today for full details.**

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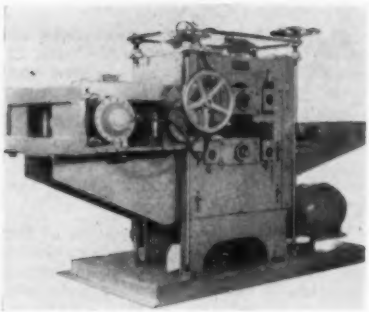


unit. Incising blade arbors are of 2¾" chrome nickle steel with a tensile strength of 125,000 pounds per square inch. Arbors and feed rolls run on anti-friction bearings, hardened steel, needle type. The driving mechanism consists of driven infeeding and outfeeding rolls and driven top and bottom cutter arbors.

Side head cutters are not driven and are actuated by the feed force of the stock. Feed roll pressure and depth of incision are regulated and controlled by means of air cylinders. Air pressure of at least 80 p.s.i. is required. The driving motor is a 7½ h.p., 3 phase, 60 cycle, connected by V-Belts and sheaves to a heavy duty worm gear reduction which transmits power to moving parts by roller chain and sprockets. Accurate scales are provided for ease of adjustments and quick change and setup.

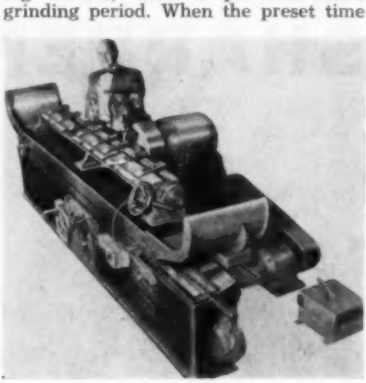
Control switch for start, stop, and reverse is also provided. The machine has a minimum capacity of 2¾"x3¾" and a maximum capacity of 6"x10". Shipping weight is approximately 4000 pounds. Manufacturer is the Precision Machine Works, 2102 A St., Tacoma, Wash.

## DEVICES CUT KNIFE GRINDING COSTS

Two new time saving devices available on the Rogers NT and 220 series machine knife grinders have been announced by the Samuel C. Rogers & Co., of Buffalo, N.Y. These two new features provide a faster grinding cycle and the most efficient use of operators' time.

One of the new features is a revolutionary air clamping device designed to provide instantaneous clamping of the knife in grinding position. Knife setup time is cut to 1/10th of the former time required to secure the knife by the "bolt" method. The operator merely aligns the knife and presses a button. The knife clamps are forced by air pressure to set a "bear grip" on the work. As an example of the time saved, —if we assume a 10 minute grind and a 20 minute knife change by the older methods (a grinding cycle of 30 minutes), the use of this Rogers air clamping device will more than double knife grinding production.

Another feature provided with the Rogers NT and 220 series grinders is the first automatic timing service ever successfully designed for a knife grinder. This patented Rogers device automatically stops the grinder, including motors, after a pre-determined grinding period. When the preset time

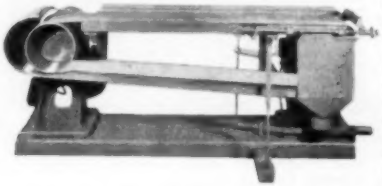


has expired, the grinder continues operation till the end of its stroke to prevent burning or uneven work. The automatic infeed operates in conjunction with the timing device and can be set within limits of .0005" to .005" grind per table cycle. A safety device prevents accidental starting of the knife table or grinding head.

## SEMI-AUTOMATIC DRAWER SANDER

The Oakley Company, Inc., Bristol, Tennessee, manufacturers of a complete line of belt sanders for the woodworking industry, for the past 20 years, now announce the availability of a completely new semi-automatic drawer sander for sanding dovetailed lipped drawers with the grain.

This new Oakley drawer sander, known as the Model "H", incorporates the use of a new dual-motor drive arrangement which consists of the use of two motors for driving the sand belt, one motor on each of the two pulleys. The first motor pulls the sand belt over the platens and down over the angle or contact lip where the belt takes the downward turn for sanding dovetailed lips, while the other motor, synchronized to the first, pushes the sand belt up to this angle or contact lip. This dual-motor drive arrangement has not only increased the power of the machine making it impossible to stall with an unusual amount of pressure, but it has also eliminated a great deal of the friction and resulting heat caused by the dead drag of the sand belt over the contact lip when pulled by just one motor.



This sander also incorporates a newly designed platen and contact lip which makes it unnecessary to have any type of anti-friction covering over the platen and contact lip. The newly designed platen and contact lip are made up of a combination of materials which are non-conductors of heat and which, in themselves, are anti-friction surfaces thus eliminating the necessity of maintenance expenses at this point.

**Next month we are publishing a longer article on several Oakley sanding machines.**


Sensational NEW Dovetail BIT!

TUNGSTEN CARBIDE TIPPED

- TOUGHER — Cuts hardest materials easily
- CLEANER CUTS — Cuts smoother and more evenly
- LONGER LIFE — 15 to 20 times longer productive life

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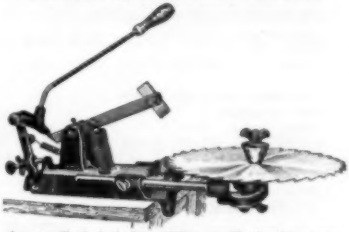
SIMPLEX
CIRCULAR SAW SETTING MACHINE



An excellent tool for setting small circular saws. The successful operation of all circular saws depends largely upon the manner in which they are fitted.

To obtain the best results the teeth should be properly and evenly set.

This machine does the work perfectly, insuring easy and true running and smooth cutting.

The hammer strikes every blow with equal force and at the same angle hence the set of each tooth is absolutely uniform. Will give a light, medium or heavy set.

Adjustable for saws, either rip or cut-off, from 5" to 24" in diameter.

The machine will last for years if handled with ordinary care and intelligence.

Further details upon request

ZEILLER & NAGEL, INC.
232 JAVA BROOKLYN, N.Y.

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# NORTHFIELD
## Single Chain Saw
# MORTISER

FOR MINIMUM OPERATOR FATIGUE

FOR LONGER CUTTING EQUIPMENT LIFE

THIS MACHINE is soundly designed for peak production, long life and minimum expense. The hydraulic feed assures maximum number of mortises per hour with minimum operator fatigue. Other features include; automatic safety stop, automatic clamps; and automatic oiling of chain saw and guide bar.

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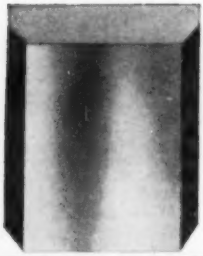

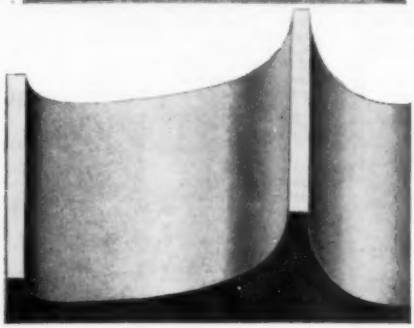

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## YOUR PRODUCTION OF NEW STYLE TRIM BY COMBINING RUNS

**Make more Mouldings**

*Less Shavings*

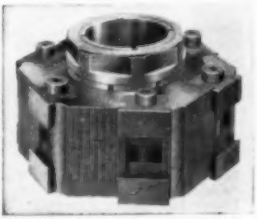
WITH

BADGER

**CUTTERHEADS**

The increasingly popular "Streamlined Casings" can be made in multiple more profitably in your plant by using Badger Milled-to-pattern Bits with Clamp T Slot Heads by combining operations. For example, it takes only one operation to make one 3/4 x 2-1/4" casing and one 3/4 x 3/4" quarter round from 4/4 stock. Both of these mouldings can be cut from one ripping, thus eliminating the extra rip and mould operations required if both pieces are run separately. Badger engineers will be glad to help you make more mouldings and less shavings by engineering your cutterhead and knife needs.

Send us your requirements. We will promptly return our suggestions and our latest catalog. Regardless of the make of your present cutterheads, Badger engineered milled-to-patterns bits will give you better finish, more production!



Badger Clamp T Slot Cutterhead with cutters removed to show heavy clamps and wide corrugations for maximum bit retention.

*Send in details on your cutting problems today!*

**WISCONSIN KNIFE WORKS** BELOIT WISCONSIN

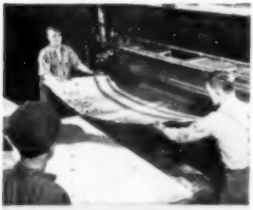
*Engineers to the Woodworking Industry*

Vestibule doors at
Darien Jr. H. S., Darien, Conn.
Product of Roddis
Plywood Corp.,
Marshfield, Wis.

# Proof against 136 Kinds of weather

## *(and thousands of children!)*

## exterior flush doors bonded with MELURAC® 300



Spread with MELURAC 300, cross-banding emerges from glue spreader ready to be applied to Roddis door core.

A visitor to New England once counted 136 kinds of weather in 24 hours! But these Connecticut-located Roddis Flush Doors can take it! For core, crossbandings and face veneers are permanently bonded with weatherproof MELURAC® Resin 300. A melamine-urea-formaldehyde adhesive of highest quality, MELURAC 300 offers a neutral, boil-resistant glue line ideal for exterior as well as interior applications.

What's more, you can make *better* exterior doors and plywood at *competitive* costs because MELURAC 300 is quick-setting, non-staining . . . has a long working life, is easy to mix and spread . . . needs only moderate curing temperature.

Build yourself *better* exterior doors, *better* exterior grade plywood . . . with MELURAC 300. We'll be glad to work with you on your application.

After placing door layups between aluminum caul boards, operators ready automatic press loader. Press accommodates 4' x 8' panels.

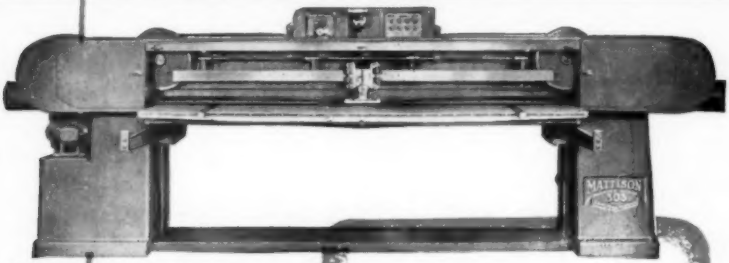
AMERICAN *Cyanamid* COMPANY

PLASTICS AND RESINS DIVISION

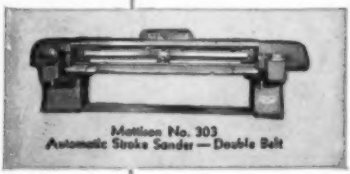
32A Rockefeller Plaza, New York 20, N. Y.

In Canada: North American Cyanamid Limited, Toronto & Montreal

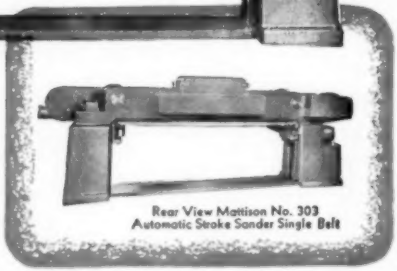
# MATTISON'S NEW
## No. 303 Automatic STROKE SANDER




Front View Mattison No. 303
Automatic Stroke Sander — Single Belt



Mattison No. 303
Automatic Stroke Sander — Double Belt



Rear View Mattison No. 303
Automatic Stroke Sander Single Belt

• The Mattison No. 303 Automatic Stroke Sander is the last word in modern engineering. From the standpoint of design — construction — smoothness of operation and appearance, it is in a class by itself. Results that can be expected are faster output, better quality of work, and trouble free operation. These important features are all to your advantage. Hydraulic system for operation of shoe is simple yet positive in action, providing smooth operation of sanding shoe the entire length of stroke. Belt speeds to meet your needs. All controls are within easy reach of operator. The sand belt is completely enclosed at top and both ends for dust control and safety. Belts are easily and quickly changed. Aluminum sanding shoe is mounted on ball bearings for easy operation and control. Massive base and column construction provide solid foundation. The Mattison No .303 Automatic Stroke Sander is recommended as the most efficient method for finish sanding large, flat surfaces such as tops, panels, doors, etc. It provides perfect work on a real production basis. Double-belt model with coarse belt for removing tape and glue, and fine belt for finish sanding, speeds up production by reducing handling time and, in many cases, eliminates drum sander operation.

Send for complete information on the 303, the latest in stroke sanders.

**MATTISON MACHINE WORKS**

ROCKFORD • ILLINOIS